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SHARP 21FL91 SERVICE MANUAL

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Service Mode

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SHARP

SERVICE MANUAL

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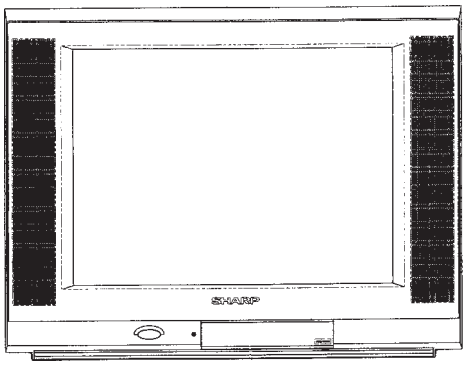

COLOR TELEVISION

Chassis No. GA-2

MODEL **21FL91**

In the interests of user-safety (Required by safety regulations in some countries) the set should be restored to its original condition and only parts identical to those specified should be used.

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ELECTRICAL SPECIFICATIONS

POWER INPUT ..... AC 110~220 V, 50/60 Hz
POWER RATING 95W
PICTURE SIZE ..... 1,239 cm^2 (192sq inch)
CONVERGENCE ..... Magnetic
SWEEP DEFLECTION ..... Magnetic
FOCUS ..... Hi-Bi-Potential Electrostatic
INTERMEDIATE FREQUENCIES
  Picture IF Carrier Frequency ..... 45.75 MHz
  Sound IF Carrier Frequency ..... 41.25 MHz
  Color Sub-Carrier Frequency ..... 42.17 MHz
  (Nominal)
AUDIO POWER
  OUTPUT RATING ..... 3.0 W(RMS) x 2pcs
SPEAKER
  SIZE ..... 12 x 5 cm, 2pcs
  VOICE COIL IMPEDANCE ..... 16 ohm at 400 Hz
ANTENNA INPUT IMPEDANCE
  VHF/UHF ..... 75 ohm Unbalanced
TUNING RANGES
  VHF-Channels ..... 2 thru 13
  UHF-Channels ..... 14 thru 69
  CATV Channels ..... 1 thru 125
  (EIA, Channel Plan U.S.A.)

Specifications are subject to change without prior notice.

SHARP CORPORATION

This document has been published to be used for after sales service only.
The contents are subject to change without notice.

IMPORTANT SERVICE SAFETY PRECAUTION

■ **Service work should be performed only by qualified service technicians who are thoroughly familiar with all safety checks and the servicing guidelines which follow:**

WARNING

1. For continued safety, no modification of any circuit should be attempted.
2. Disconnect AC power before servicing.
3. Semiconductor heat sinks are potential shock hazards when the chassis is operating.
4. The chassis in this receiver has two ground systems which are separated by insulating material. The non-isolated (hot) ground system is for the B+ voltage regulator circuit and the horizontal output circuit. The isolated ground system is for the low B+ DC voltages and the secondary circuit of the high voltage transformer.
   To prevent electrical shock use an isolation transformer between the line cord and power receptacle, when servicing this chassis.

SERVICING OF HIGH VOLTAGE SYSTEM AND PICTURE TUBE

When servicing the high voltage system, remove the static charge by connecting a 10k ohm resistor in series with an insulated wire (such as a test probe) between the picture tube ground and the anode lead. (AC line cord should be disconnected from AC outlet.)

1. Picture tube in this receiver employs integral implosion protection.
2. Replace with tube of the same type number for continued safety.
3. Do not lift picture tube by the neck.
4. Handle the picture tube only when wearing shatterproof goggles and after discharging the high voltage anode completely.

X-RADIATION AND HIGH VOLTAGE LIMITS

1. Be sure all service personnel are aware of the procedures and instructions covering X-radiation. The only potential source of X-ray in current solid state TV receivers is the picture tube. However, the picture tube does not emit measurable X-Ray radiation, if the high voltage is as specified in the "High Voltage Check" instructions.
   It is only when high voltage is excessive that X-radiation is capable of penetrating the shell of the picture tube including the lead in the glass material. The important precaution is to keep the high voltage below the maximum level specified.
2. It is essential that servicemen have available at all times an accurate high voltage meter.
   The calibration of this meter should be checked periodically.
3. High voltage should always be kept at the rated value –no higher. Operation at higher voltages may cause a failure of the picture tube or high voltage circuitry and;also, under certain conditions, may produce radiation in exceeding of desirable levels.
4. When the high voltage regulator is operating properly there is no possibility of an X-radiation problem. Every time a color chassis is serviced, the brightness should be tested while monitoring the high voltage with a meter to be certain that the high voltage does not exceed the specified value and that it is regulating correctly.
5. Do not use a picture tube other than that specified or make unrecommended circuit modifications to the high voltage circuitry.
6. When trouble shooting and taking test measurements on a receiver with excessive high voltage, avoid being unnecessarily close to the receiver.
   Do not operate the receiver longer than is necessary to locate the cause of excessive voltage.

IMPORTANT SERVICE SAFETY PRECAUTION

(Continued)

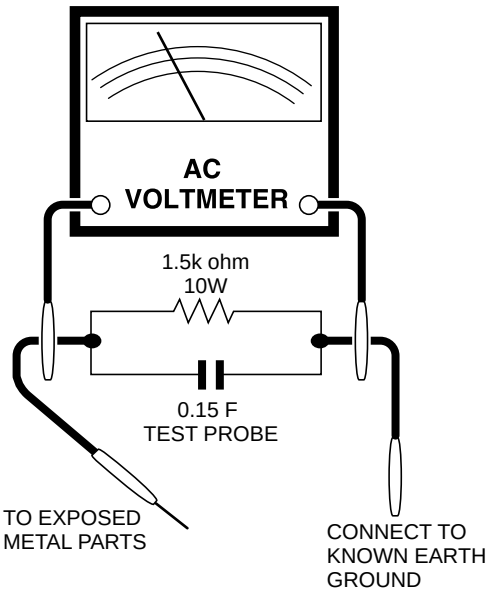
BEFORE RETURNING THE RECEIVER

(Fire & Shock Hazard)

Before returning the receiver to the user, perform the following safety checks.

1. Inspect all lead dress to make certain that leads are not pinched or that hardware is not lodged between the chassis and other metal parts in the receiver.
2. Inspect all protective devices such as non-metallic control knobs, insulating materials, cabinet backs, adjustment and compartment covers or shields, isolation resistor-capacity networks, mechanical insulators, etc.
3. To be sure that no shock hazard exists, check for leakage current in the following manner.

- Plug the AC cord directly into a 110~220 volt AC outlet, (Do not use an isolation transformer for this test).
- Using two clip leads, connect a 1.5k ohm, 10 watt resistor paralleled by a 0.15µF capacitor in series with all exposed metal cabinet parts and a known earth ground, such as electrical conduit or electrical ground connected to earth ground.
- Use an AC voltmeter having with 5000 ohm per volt, or higher, sensitivity to measure the AC voltage drop across the resistor.
- Connect the resistor connection to all exposed metal parts having a return to the chassis (antenna, metal cabinet, screw heads, knobs and control shafts, escutcheon, etc.) and measure the AC voltage drop across the resistor.
  AII checks must be repeated with the AC line cord plug connection reversed. (If necessary, a non-polarized adapter plug must be used only for the purpose of completing these check.)
  Any current measured must not exceed 0.5 milliamp. Any measurements not within the limits outlined above indicate of a potential shock hazard and corrective action must be taken before returning the instrument to the customer.



SAFETY NOTICE

Many electrical and mechanical parts in television receivers have special safety-related characteristics. These characteristics are often not evident from visual inspection, nor can protection afforded by them be necessarily increased by using replacement components rated for higher voltage, wattage, etc.
Replacement parts which have these special safety characteristics are identified in this manual; electrical components having such features are identified by "⚠" and shaded areas in the Replacement Parts Lists and Schematic Diagrams.

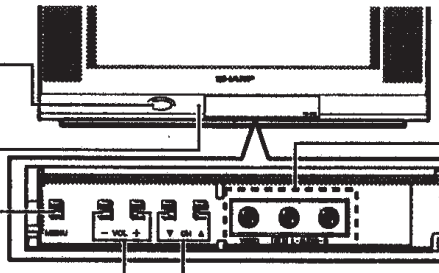
For continued protection, replacement parts must be identical to those used in the original circuit. The use of substitute replacement parts which do not have the same safety characteristics as the factory recommended replacement parts shown in this service manual, may create shock, fire, X-radiation or other hazards.

LOCATION OF USER'S CONTROL

Quick Reference Control Operation

■ Location of Controls

Front Panel



POWER
Press → On.
Press again → Off.

SENSOR AREA FOR REMOTE CONTROL

MENU
Press → Accesses MAIN MENU.
Press again → Exits MAIN MENU.

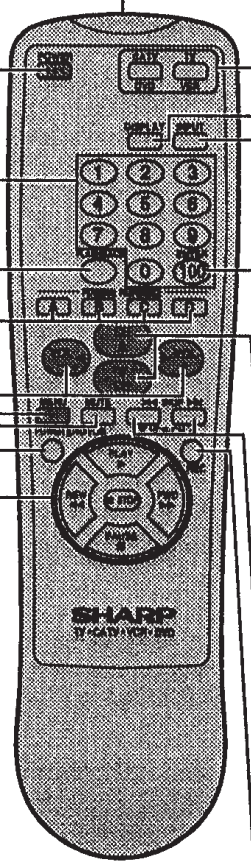
VIDEO IN 2 L-AUDIO-R

(INSIDE DOOR)

VOLUME UP/DOWN
(+) Increases sound.
(–) Decreases sound.

CHANNEL UP/DOWN
(▲) Selects next higher channel.
(▼) Selects next lower channel.

Basic Remote Control Functions



POWER
Press → On.
Press again → Off.

REMOTE KEYPAD
Accesses any channel from keypad.

FLASHBACK
Returns to previous channel.

PERSONAL PREFERENCE
With the Personal Preference buttons, you can program your favorite programs by using the 4 categories A, B, C and D. The channels can be accessed quickly by using these buttons. (See page E 24.)

VOLUME UP/DOWN
(+) Increases sound.
(–) Decreases sound.
• In menu mode, changes or selects the TV adjustments.

MENU
Press → Accesses MAIN MENU.
Press again → Exits MAIN MENU.

MUTE
Press → Mutes sound.
Press again → Restores sound.
• CLOSED CAPTION appears when sound is muted.

POWER (DVD/VCR)
Press → On.
Press again → Off.

DVD/VCR CONTROL
See page E 31.

Infrared Transmitter Window

CATV/DVD-TV/VCR MODE buttons
Press TV/VCR, sends power and channel select commands (Channel up/down and Random Access buttons) to the TV and VCR control.
Press CATV/DVD, sends power and channel select commands to a cable TV converter and DVD control.

DISPLAY
Press → Displays receiving channel for four seconds.
Press again → Removes display.
• Temporarily displays receiving channel when in Closed Caption mode.

INPUT
Press → Switch to external video INPUT 1 mode or COMPONENT mode.
Press 2 times → Switch to external video INPUT 2 mode.
Press 3 times → Switch back to the original TV mode.
See page E 29.

ENTER
Used in some instances where a Cable Converter Box requires an "enter" command after selecting channels, when using the **REMOTE KEYPAD** button. (See page E 31)

CHANNEL UP/DOWN
(▲) Selects next higher channel.
(▼) Selects next lower channel.
• See pages E 21 ~ E 23 for channel presetting.
• Moves the " ● " mark of the MENU screens.

SKIP/VCR-CH

REC

Note:

- The above shaded buttons on the Remote Control glow in the dark. To use the glow-in-the-dark display on the remote control, place it under a fluorescent light or other lighting.
- The phosphorescent material contains no radioactive or toxic material, so it is safe to use.
- The degree of illumination will vary depending on the strength of lighting used.
- The degree of illumination will decrease with time and depending on the temperature.
- The time needed to charge the phosphorescent display will vary depending on the surrounding lighting.
- Sunlight and fluorescent lighting are the most effective when charging the display.

INSTALLATION AND SERVICE INSTRUCTIONS

Note: (1) When performing any adjustments to resistor controls and transformers use non-metallic screwdrivers or TV alignment tools.
(2) Before performing adjustments, the TV set must be on at least 15 minutes.

CIRCUIT PROTECTION

The receiver is protected by a 3.15A fuse (F701), mounted on PWB-A, wired into one side of the AC line input.

X-RADIATION PROTECTOR CIRCUIT TEST

After service has been performed on the horizontal deflection system, high voltage system, B+ system, test the X-Radiation protection circuit to ascertain proper operation as follows:

1. Apply 110~220V AC using a variac transformer for accurate input voltage.
2. Allow for warm up and adjust all customer controls for normal picture and sound.
3. Receive a good local channel.
4. Connect a digital voltmeter to TP653 and make sure that the voltmeter reads 18.9 ±1.1V.
5. Apply external 24.5V DC at TP653 by using an external DC supply, TV must be shut off.
6. To reset the protector, unplug the AC cord and make a short circuit between TP651 and TP652. Now make sure that normal picture appears on the screen.
7. If the operation of the horizontal oscillator does not stop in step 5, the circuit must be repaired before the set is returned to the customer.

HIGH VOLTAGE CHECK

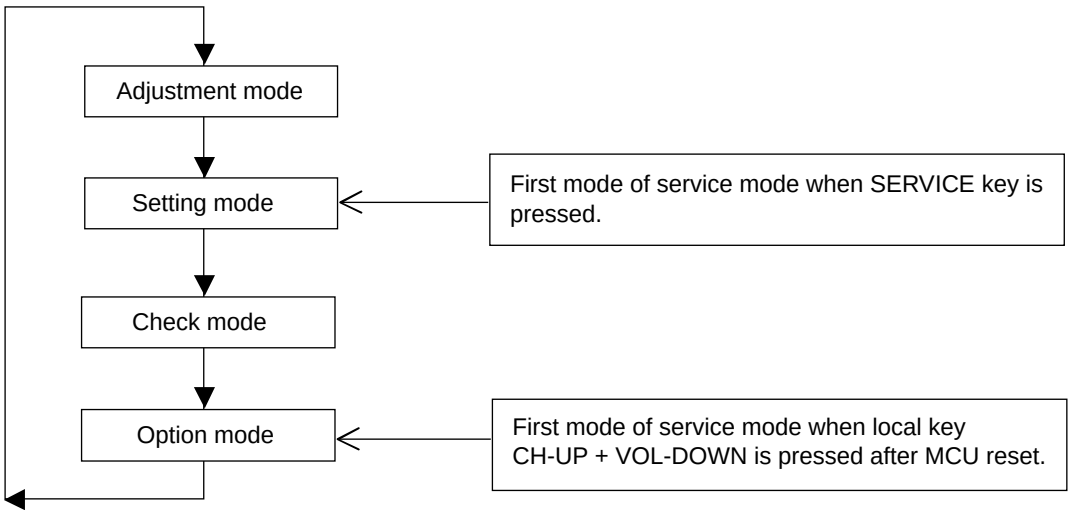
High voltage is not adjustable but must be checked to verify that the receiver is operating within safe and efficient design limitations as specified checks should be as follows:

1. Connect an accurate high voltage meter between ground and anode of picture tube.
2. Operate receiver for at least 15 minutes at 110~220V AC line voltage, with a strong air signal or a properly tuned in test signal.
3. Enter the service mode and set Y-mute ON by using Service R/C.
4. The voltage should be approximately 28.7kV (at zero beam).
   If a correct reading cannot be obtained, check circuitry for malfunctioning components. After the voltage test, make Y-mute off to the normal mode.

SERVICE MODE

Service Mode Overview

1. Service mode is entered by SERVICE key input or CH-UP +VOL-DOWN input during reset.
2. Service mode is cleared by entering SERVICE key command during service mode.
3. If key input port (SERVICE) input is LOW, then it is in service mode.
4. During key input port (SERVICE) input is LOW, clearing service mode by key input SERVICE is disabled.
5. Service mode can be switched to 4 modes as follows by key input MENU;


Adjustment mode
Setting mode
First mode of service mode when SERVICE key is pressed.
Check mode
Option mode
First mode of service mode when local key CH-UP + VOL-DOWN is pressed after MCU reset.

6. AFT processing is disabled during service mode. PLL setting data is set to fo data.
7. All user data are set to default during service mode. FAO and SPEAKER user settings are off and on respectively in service mode. Energy Save is off.
8. Sleep timer, View timer and Off timer are inactivated in Service mode.
9. Sound is muting in service mode except at Adjustment Items V20, M01, M03, M04, M05, and M06.

Adjustment Mode Items

No.	Item Name	IC	Register	Range	Default
V01	SUB-PICTURE	1 Chip	CONTRAST	0~127	127
V02	SUB-TINT	1 Chip	TINT	0~127	64
V03	SUB-COLOR	1 Chip	COLOR	0~127	64
V04	SUB-BRIGHT	1 Chip	BRIGHT	0~255	128
V05	SUB-SHARP	1 Chip	VIDEO-TONE	0~63	32
V06	V-SHIFT	1 Chip	V-SHIFT	0~7	4
V07	H-SHIFT	1 Chip	H-PHASE	0~31	16
V08	RF-AGC	1 Chip	RF-Delay	0~127	127
V09	V-SIZE	1 Chip	V-SIZE	0~63	32
V10	PIF-VCO	1 Chip	VIF-VCO	0~63	32
V11	R-CUTOFF	1 Chip	R-CUTOFF	0~255	127
V12	G-CUTOFF	1 Chip	G-CUTOFF	0~255	127
V13	B-CUTOFF	1 Chip	B-CUTOFF	0~255	127
V14	R-DRIVE	1 Chip	R-DRIVE	0~127	64
V15	B-DRIVE	1 Chip	B-DRIVE	0~127	64
V16	SUB-COLOR(YUV)	1 Chip	COLOR	0~127	64
V17	SUB-TINT(YUV)	1 Chip	BASEBAND-TINT	0~127	64
V18	CC-POS	MICON		0~255	32
V19	(Vertical mode)	1 Chip	V-MUTE,SERVICE	0, 1, 2	0
V20	SUB-VOL	1 Chip	A-ATT	0~127	127
V21	H-VCO	1 Chip	H-VCO	0~7	4
M01	MTS-ATT	MTS	ATT	0~15	10
M02	MTS-VCO	MTS	VCO	0~63	32
M03	MTS-FILTER	MTS	FILTER	0~63	28
M04	MTS-WIDEBAND	MTS	WIDEBAND	0~63	27
M05	MTS-SPECTRAL	MTS	SPECTRAL	0~63	32
M06	SUB-VOL	MTS	VOL	0~63	63

■ SELF ADJUSTMENT

H-VCO

1. When there is H-VCO self-adjustment key input for adjustment item H-VCO, self-adjustment is performed.
2. H-FREE(1chip) is set to 1.
3. H-OUT is set by intelligent monitor output.
4. IM input is set as TIM input.
5. H-VCO(1chip) data is changed so that the number of input pulse is 125 inside 8ms interval.
6. When adjustment completed, OSD display and H-VCO self-adjustment status data of EEPROM are updated.
7. H-FREE(1chip), intelligent monitor output and IM input mode are recovered.

RF-AGC

1. When there is RF-AGC self-adjustment key input for adjustment item RF-AGC, self-adjustment is performed.
2. AGC-OUT is set by intelligent monitor output.
3. IM input is set as AD input.
4. By decreasing RF-AGC (1chip) data from current RF-AGC adjustment value to 0, AFT input voltage becomes the maximum setting value.
5. Increase RF-AGC(1chip) data, when AFT input voltage is at (max. 0.3V) point, adjustment is completed.
6. When adjustment completed, OSD display and RF-AGC self-adjustment status data of EEPROM are updated.
7. Intelligent monitor output and IM input mode are recovered.

PIF-VCO

1. When there is PIF-VCO self-adjustment key input for adjustment item PIF-VCO, self-adjustment is performed.
2. VIF-DEF(1chip) is set to 1.
3. AFC is set by intelligent monitor output.
4. IM input is set as AD input.
5. VIF-VCO(1chip) data is changed so that input voltage becomes 2.5V.
6. When adjustment completed, OSD display and PIF-VCO self-adjustment status data of EEPROM are updated.
7. VIF-DEF(1chip), intelligent monitor output and IM input mode are recovered.

MTS-FILTER

Adjustment is performed in the center of the range when FILTER status is OK.

1. If data is changed from 0 to 63, point where NG → OK is A and point where OK → NG is B.
2. If data is changed from 63 to 0, point where NG → OK is C and point where OK → NG is D.
3. (A+B+C+D)/4 is the adjustment point.

Setting Mode Items

No.	Item Name	IC	Register	Range	Default
F01	VideoTone-Gain (TV)	1chip	V-TONE	0 / 1	0
F02	VideoTone-Gain (AV)	1chip	V-TONE	0 / 1	0
F03	VideoTone-Gain(YUV)	1chip	V-TONE	0 / 1	0
F04	ABCL	1chip	ABCL	0 / 1	0
F05	BS	1chip	BS-OFF	0 / 1	0
F06	ABCL-G	1chip	ABCL-G	0 / 1	0
F07	SHP-AV	OFFSET	VIDEO-TONE(OFFSET)	-16~+16	0
F08	SHP-YUV	OFFSET	VIDEO-TONE(OFFSET)	-16~+16	0
F09	RGB-CLIP	1chip	ExtRGB-Clip	0 / 1	0
F10	E-SAVE	OFFSET	CONTRAST(OFFSET)	0~63	30
F11	FAO-VOL	1chip	A-ATT	0~127	120
F12	PIF-G	1chip	VIF-GAIN	0~7	4
F13	Y-DELAY(TV)	1chip	Y-Delay	0~7	0
F14	Y-DELAY(AV)	1chip	Y-Delay	0~7	0
F15	Y-DELAY(YUV)	1chip	Y-Delay	0~7	0
F16	TINT-AV	OFFSET	TINT(OFFSET)	-32~+32	0
F17	COL-AV	OFFSET	COLOR(OFFSET)	-32~+32	0
F18	R-DRI(R2)	OFFSET	R-DRI(OFFSET)	-32~+32	0
F19	R-DRI(R)	OFFSET	R-DRI(OFFSET)	-32~+32	0
F20	R-DRI(B)	OFFSET	R-DRI(OFFSET)	-32 ~+32	0
F21	B-DRI(R2)	OFFSET	B-DRI(OFFSET)	-32~+32	0
F22	B-DRI(R)	OFFSET	B-DRI(OFFSET)	-32~+32	0
F23	B-DRI(B)	OFFSET	B-DRI(OFFSET)	-32~+32	0
F24	V-FREE	1chip	V-FREE	0 / 1	0
F25	GAMMA	1chip	GAMMA	0~3	0
F26	TRAP(TV)	1chip	TRAP-FINE	0~3	2
F27	TRAP(AV)	1chip	TRAP-FINE	0~3	2
F28	H-FREE	1chip	H-FREE	0 / 1	0
F29	1W(TV)	1chip	V.Window	0 / 1	0
F30	1W(AV)	1chip	V.Window	0 / 1	0
F31	YLPF	1chip	YSW-LPF	0 / 1	1
F32	BS-D	1chip	BS-DISCHARGE	0~3	0
F33	BS-C	1chip	BS-CHARGE	0~3	0
F34	SL(TV)	1chip	S-SLICE DOWN	0~3	0
F35	SL(AV)	1chip	S-SLICE DOWN	0~3	0
F36	SL(YUV)	1chip	S-SLICE DOWN	0~3	0
F37	AFC2	1chip	AFC2-G	0 / 1	0
F38	VD(TV)	1chip	Vsync-Det	0 / 1	0
F39	VD(AV)	1chip	Vsync-Det	0 / 1	0
F40	AS(TV)	1chip	Auto-Slice	0 / 1	0
F41	AS(AV)	1chip	Auto-Slice	0 / 1	0
F42	AS(YUV)	1chip	Auto-Slice	0 / 1	0
F43	FBP(TV)	1chip	FBP Vth	0 / 1	0
F44	FBP(AV)	1chip	FBP Vth	0 / 1	0
F45	FBP(YUV)	1chip	FBP Vth	0 / 1	0
F46	C.Clip Level	1chip	C.Clip Level	0 / 1	0
F47	PSW	MTS	PSW	0 / 1	0
F48	FAO-VOL	MTS	VOL	0~63	60
F49	CP	PLL	CP	0 / 1	0
F50	CC LEVEL	MICON		0 / 1	0
F51	OSD POS	MICON		0 / 1	0
F52	OFFSET-ADJ-COL	1 chip	COLOR	-32~32	0
F53	OFFSET-ADJ-TINT	1 chip	TINT	-32~32	0
F54	OFFSET-ADJ-TINT-YUV	1 chip	BASEBAND-TINT	-32~32	0

Option Mode Items

No	ITEM	0	1	DEFAULT
O01	DEM0	Without DEMO	With DEMO	1
O02	DOWNLOAD	Without V-CHIP OP	With V-CHIP OP	1
O03	V-CHIP	Without V-CHIP	With V-CHIP	1
O04	SPEAKER	Without SPEAKER	With SPEAKER	1
O05	FAO	Without FAO	With FAO	1
O06	P.PREF	Without P.PREF	With P.PREF	1
O07	UNIV+	Without UNIV+	With UINIV+	1
O08	VIEW TIMER	Without VIEW TIMER	With VIEW TIMER	1
O09	EZ-SETUP	EZ-SETUP	AUTO PRESET	1
O10	PON-CH	Without POWER-ON	With POWER-ON	1
O11	FAV-COL	FAV-COL	COL-TEMP	1
O12	COMPONENT	Without COMPONENT	With COMPONENT	1
O13	AV	Without AV	With AV	1
O14	AV2	AV1 system	AV2 system	1
O15	MTS	Without MTS	With MTS	1
O16	TONE-CTRL	Without S-ADJ	With S-ADJ	1
O17	AUTO-OFF	Without AUTO-OFF	With AUTO-OFF	1
O18	INIT-LANG	ENGLISH	SPANISH	0
O19	SETUP-FLAG	NO SETUP	AUTO SETUP	1
O20	FR.AV (Front, Rear AV)	3: Display "FRONT A/V INPUTS" and "REAR A/V INPUTS" in DEMO mode. 2: Display "FRONT A/V INPUTS" only in DEMO mode. 1: Display "REAR A/V INPUTS" only in DEMO mode. 0: No display of above lines in DEMO mode.		2

Check Mode

Micron mask version, software version and ROM correction function status are displayed in check mode.

ADJUSTMENT METHOD

Caution: to get into the service mode, one of the ways is press direct key for service items. the other ways is short the main chassis JA309 and JA402

There is three stage of Service Mode data
First stage data from V01 ~ M06
to go into second stage of service mode data, press MENU key
Second stage data from F01 ~ F54
to go into third stage of service mode data, press MENU key twice
Third stage data from 001 ~ 020

Below is the contents of these data

First Stage

Data	Service Mode	Function	Range	Default Data
V01	SUB-PICTURE	CONTRAST	0~127	127
V02	SUB-TINT	TINT	0~127	64
V03	SUB-COLOR	COLOR	0~127	64
V04	SUB-BRIGHT	BRIGHT	0~255	128
V05	SUB-SHARP	VIDEO-TONE	0~63	32
V06	V-SHIFT	V-SHIFT	0~7	4
V07	H-SHIFT	H-PHASE	0~31	16
V08	RF-AGC	RF-DELAY	0~127	127
V09	V-SIZE	V-SIZE	0~63	32
V10	PIF-VCO	VIF-VCO	0~63	32
V11	R-CUTOFF	R-CUTOFF	0~255	127
V12	G-CUTOFF	G-CUTOFF	0~255	127
V13	B-CUTOFF	B-CUTOFF	0~255	127
V14	R-DRIVE	R-DRIVE	0~127	64
V15	B-DRIVE	B-DRIVE	0~127	64
V16	SUB-COLOR(YUV)	COLOR	0~127	64
V17	SUB-TINT(YUV)	BASEBAND-TINT	0~127	64
V18	CC-POS	CC-POSITION	0~255	32
V19	SCREEN CUT OFF	CUT OFF		0
V20	SUB-VOL	A-ATT	0~127	127
V21	H-VCO	H-VCO	0~7	4
M01	MTS-ATT	ATT (MTS)	0~15	10
M02	MTS-VCO	VCO (MTS)	0~63	32
M03	MTS-FILTER	FILTER (MTS)	0~63	28
M04	MTS-WIDEBAND	WIDEBAND (MTS)	0~63	27
M05	MTS-SPECTRAL	SPECTRAL (MTS)	0~63	32
M06	SUB-VOL	VOL (MTS)	0~63	63

Auto Adjustment Item
1. H-VCO (Currently need manual adj)
2. RF-AGC
3. PIF-VCO
4. MTS-FILTER

Second Stage

Data	Service Mode	Function	Range	Default Data
F01	VIDEO TONE -GAIN (TV)	V-TONE	0/1	0
F02	VIDEO TONE -GAIN (AV	V-TONE	0/1	0
F03	VIDEO TONE -GAIN(YUV)	V-TONE	0/1	0
F04	ABCL	ABCL	0/1	0
F05	BS	BS-OFF	0/1	0
F06	ABCL-G	ABCL-G	0/1	0
F07	SHP-AV	VIDEO-TONE(OFFSET)	-16~+16	0
F08	SHP-YUV	VIDEO-TONE(OFFSET)	-16~+16	0
F09	SHP-CLIP	EXTRGB-CLIP	0/1	0
F10	E-SAVE	CONTRAST(OFFSET)	0~63	30
F11	FAO-VOL	A-ATT	0~127	120
F12	PIF-G	VIF-GAIN	0~7	4
F13	Y-DELAY(TV)	Y-DELAY	0~7	0
F14	Y-DELAY(AV)	Y-DELAY	0~7	0
F15	Y-DELAY(YUV)	Y-DELAY	0~7	0
F16	TINT-AV	TINT(OFFSET)	-32~+32	0
F17	COL-AV	COLOR(OFFSET)	-32~+32	0
F18	R-DRI(R2)	R-DRI(OFFSET)	-32~+32	0
F19	R-DRI(R)	R-DRI(OFFSET)	-32~+32	0
F20	R-DRI(B)	R-DRI(OFFSET)	-32~+32	0
F21	B-DRI(R2)	B-DRI(OFFSET)	-32~+32	0
F22	B-DRI(R)	B-DRI(OFFSET)	-32~+32	0
F23	B-DRI(B)	B-DRI(OFFSET)	-32~+32	0
F24	V-FREE	V-FREE	0/1	0
F25	GAMMA	GAMMA	0~3	0
F26	TRAP(TV)	TRAP-FINE	0~3	2
F27	TRAP(AV)	TRAP-FINE	0~3	2
F28	H-FREE	H-FREE	0/1	0
F29	1W(TV)	V.WINDOW	0/1	0
F30	1W(AV)	V.WINDOW	0/1	0
F31	YLPF	YSW-LPF	0/1	1
F32	BS-D	BS-DISCHARGE	0~3	0
F33	BS-C	BS-CHARGE	0~3	0
F34	SL(TV)	S-SLICE DOWN	0~3	0
F35	SL(AV)	S-SLICE DOWN	0~3	0
F36	SL(YUV)	S-SLICE DOWN	0~3	0
F37	AFC2	AFC2-G	0/1	0
F38	VD(TV)	VSYNC-DET	0/1	0
F39	VD(AV)	VSYNC-DET	0/1	0
F40	AS(TV)	AUTO-SLICE	0/1	0
F41	AS(AV)	AUTO-SLICE	0/1	0
F42	AS(YUV)	AUTO-SLICE	0/1	0
F43	FBP(TV)	FBP VTH	0/1	0
F44	FBP(AV)	FBP VTH	0/1	0
F45	FBP(YUV)	FBP VTH	0/1	0
F46	C.CLIP LEVEL	C.CLIP LEVEL	0/1	0
F47	PSW	PSW	0/1	0
F48	FAO-VOL	VOL	0~63	60
F49	CP	CHARGE PUMP	0/1	0
F50	CC LEVEL	CC LEVEL	0/1	0
F51	OSD POS	OSD POS	0/1	0
F52	COL OFFSET	(SUR → NOR)		0
F53	TINT OFFSET	(SUR → NOR)		0
F54	TING-YUV	TINT-YUV(OFFSET)		0

Third Stage

Data	Service Mode	DATA="0"	DATA="1"	Default Data
001	DEMO	DEMO DISABLE	ON	1
002	DOWNLOAD	V-CHIP OP DISABLE	ON	1
003	V-CHIP	V-CHIP DISABLE	ON	1
004	SPEAKER	SPEAKER DISABLE	ON	1
005	FAO	FAO DISABLE	ON	1
006	P.PREF	P.REF DISABLE	ON	1
007	UNIV+	UNIV+ DISABLE	ON	1
008	VIEW TIMER	VIEW TIMER DISABLE	ON	1
009	EZ-SETUP	EZ-SETUP	AUTO PRESET	1
010	*PON-CH	POWER-ON DISABLE	ON	1
011	FAV-COL	FAV-COL	COL-TEMP	1
012	COMPONENT	COMPONENT DISABLE	ON	1
013	AV	AV DISABLE	ON	1
014	AV2	AV2 DISABLE	ON	1
015	MTS	MTS DISABLE	ON	1
016	TONE-CTRL	S-ADJ DISABLE	ON	1
017	AUTO-OFF	AUTO-OFF DISABLE	ON	1
018	INIT-LANG	ENGLISH	SPANISH	0
019	SETUP-FLAG	NO SET UP	AUTO SET UP	1
020	AV-FR	"0"=NO AV "1"=REAR "2"=FRONT "3"=REAR & FRONT		2

*POWER ON BY CH-UP/CH-DOWN KEY

ADJUSTMENT ITEM	OPTION SET UP		
ADJUSTMENT POSITION	REFER AS BELOW	STEP RANGE	REFER AS BELOW
CONTROL	–		
PRE-ADJUST REQUIREMENT	–		
CONTENT	–		
INPUT CONDITION	21FL91		
OUTPUT	OSD CHECKING		

ADJUSTMENT PROCEDURE

BUS OPTION FOR THIRD STAGE SERVICE DATA

FUNCTION	001 DEMO	002 DOWNLOAD	003 V-CHIP	004 SP	005 FAO	006 P.PREF	007 UNIV+	008 VIEW	009 EZ	010 PON-CH
21FL91	1	0	0	1	1	1	1	1	0	0
DEF	**"0"=DISABLE "1"=ENABLE** 009 → "0"=EZ-SETUP "1"=AUTO PRESET									

BUS OPTION FOR THIRD STAGE SERVICE DATA

FUNCTION	011 FAV-COL	012 COMP	013 AV	014 AV2	015 MTS	016 TONE	017 AUTO	018 LAN	019 SETUP	020 AV-FR
21FL91	1	1	1	1	1	1	1	1	1	3
DEF	011 → "0"=FAV-COL "1"=COL-TEMP 018 → "0"=ENGLISH "1"=SPANISH 019 → "0"=NO SET UP "1"=AUTO SETUP									

ADJUSTMENT ITEM	BUS SET UP		
ADJUSTMENT POSITION	REFER AS BELOW	STEP RANGE	REFER AS BELOW
CONTROL	–		
PRE-ADJUST REQUIREMENT	–		
CONTENT	–		
INPUT CONDITION	21FL91		
OUTPUT	OSD CHECKING		

ADJUSTMENT PROCEDURE

DATA SETUP FOR FIRST AND SECOND STAGE SERVICE DATA

FUNCTION	V05 SHARP	F13 Y-DL(TV)	F14 Y-DL(AV)	F16 TINT-AV	F17 COL-AV	F30 1W(AV)	F34 SL(TV)	F38 VD(TV)	F40 AS(TV)	F49 CP	F18 R-D(R2)
21FL91	50	5	2	-7	4	1	1	1	1	1	+8
DEF											

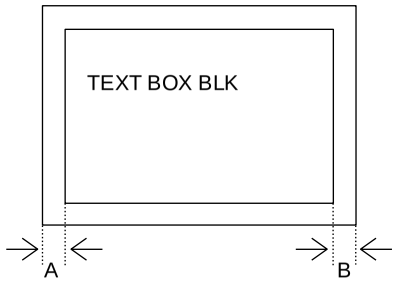
DATA SETUP FOR FIRST AND SECOND STAGE SERVICE DATA

FUNCTION	F19 R-D(R)	F20 R-D(B)	F21 B-D(R2)	F22 B-D(R)	F23 B-D(B)	F52 C-OF	F53 TI-OF	F35 SL(AV)	F41 AS(AV)	F48 FAO-VOL	F54 TINT-YUV
21FL91	+3	-2	-18	-8	+6	+10	+8	1	1	58	-8
DEF											

ADJUSTMENT ITEM	H-POSITION		
ADJUSTMENT POSITION	V07	STEP RANGE	0-31
CONTROL	I^2C BUS CONTROL		
PRE-ADJUST REQUIREMENT	OPTION SET UP, BUS SET UP, CRT-PURITY		
CONTENT	US 4 CH LION HEAD (MONOSCOPE)		
INPUT CONDITION	AC 220V, MEXICO MAGNETIC FIELD		
OUTPUT	CONFIRMATION BY CRT SCREEN		
ADJUSTMENT PROCEDURE	1. ADJUST THE **V07** BUS DATA TO HAVE A BALANCE POSITION TO SPEC OF **A=B**. 2. IF CANNOT MAKE IT TO **A=B**, ADJ FROM THE BEST POINT SO THAT **B** SLIDELY SMALLER THAN **A** 		
	[CHECKING SPEC] LEFT AND RIGHT SYMMETRICAL		

ADJUSTMENT ITEM	V-SIZE		
ADJUSTMENT POSITION	V09	STEP RANGE	0~63
CONTROL	I^2C CONTROL		
PRE-ADJUST REQUIREMENT	OPTION SET UP, BUS SET UP, CRT PURITY, V-PHASE, +B ADJUST		
CONTENT	US 4 CH LION HEAD		
INPUT CONDITION	AC 220V		
OUTPUT	CONFIRMATION BY CRT SCREEN		
ADJUSTMENT PROCEDURE	ADJUST THE V09 BUS DATA UNTILL THE OVERSCAN BECOME AS SPECIFIED BELOW. CAUTION: - PLEASE AGING TV MORE THAN 10 MINUTES BEFORE ADJUSTMENT.		
	[CHECKING SPEC] OVERSCAN 10 ± 2.5%		

ADJUSTMENT ITEM	V-PHASE		
ADJUSTMENT POSITION	V06	STEP RANGE	0-7
CONTROL	I^2C CONTROL		
PRE-ADJUST REQUIREMENT	OPTION SET UP, BUS SET UP, CRT-PURITY		
CONTENT	US 4 CH LION HEAD (MONOSCOPE PATTERN)		
INPUT CONDITION	220V, RF INPUT, ZERO MAGNETIC FIELD		
OUTPUT	CONFIRMATION ON CRT SCREEN		
ADJUSTMENT PROCEDURE	ADJUST V06 BUS DATA TO HAVE MOST ACCEPTABLE VERTICAL POSITION. THE MONOSCOPE PATTERN SHOULD BE BALANCE IN VERTICAL POSITION **NOTE: THE DATA FOR V06 LIMIT AT <= 04, EVEN POSITION GOOD ENOUGH**		
	[CHECKING CONFIRMATION]		

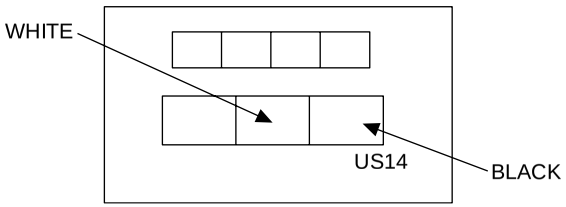
ADJUSTMENT ITEM	CLOSED CAPTION SET UP		
ADJUSTMENT POSITION	V18	STEP RANGE	0~255
CONTROL	I^2C CONTROL		
PRE-ADJUST REQUIREMENT	OPTION SET UP, BUS SET UP		
CONTENT	US 4 CH LION HEAD		
INPUT CONDITION	AC 220V		
OUTPUT	CONFIRMATION ON CRT DISPLAY.		
ADJUSTMENT PROCEDURE	1) BY SELECTING THE **V18**, BOX BLK TEXT WILL BE APPEARED. 2) ADJUST THE **V18** BUS DATA TO HAVE A BALANCE POSITION TO SPEC OF A=B.  		
	[CHECKING SPEC] LEFT AND RIGHT SYMMETRICAL		

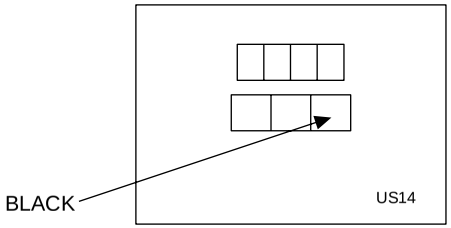
ADJUSTMENT ITEM	H-VCO		
ADJUSTMENT POSITION	V21	STEP RANGE	0-7
CONTROL	I²C CONTROL		
PRE-ADJUST REQUIREMENT	OPTION SET UP, BUS SET UP		
CONTENT	NO SIGNAL (RASTER) CONDITION		
INPUT CONDITION	AC 220V		
OUTPUT	IC 801 PIN 11		
ADJUSTMENT PROCEDURE	**(MANUAL ADJ)** 1) GO TO SERVICE MODE, 2) GO TO SERVICE DATA **V21**, ADJ UNTIL FREQ AS BELOW **(SELF ADJ)** 1) GO TO SERVICE MODE,BY SELECTING THE SERVICE DATA **V21** 2) PRESS THE R/C TO OPERATE AUTO H-VCO,OSD APPEAR "OK" AT SCREEN 3) IF APPEAR "NG" PLS REPEAT STEP2		
	[CHECKING SPEC] **FREQ = 15.735 ± 0.2 KHz**		

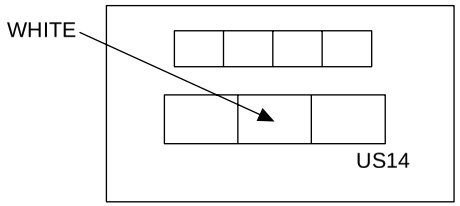
ADJUSTMENT ITEM	PIF-VCO		
ADJUSTMENT POSITION	V10	STEP RANGE	0~63
CONTROL	I²C CONTROL		
PRE-ADJUST REQUIREMENT	OPTION SET UP, BUS SET UP		
CONTENT	NO SIGNAL (RASTER) CONDITION		
INPUT CONDITION	AC 220V		
OUTPUT	CONFIRMATION ON CRT DISPLAY (AUTO), IC801 PIN 2 VOLTAGE (MANUAL).		
ADJUSTMENT PROCEDURE	**(AT SELF ADJUSTMENT MODE)** 1) GO INTO SERVICE MODE, BY SELECTING THE SERVICE DATA V10 2) PRESS THE R/C FOR AUTO PIF-VCO KEY, OSD APPEAR “OK” AT SCREEN 3) IF APPEAR “NG” PLS REPEAT STEP2 **(AT MANUAL ADJUSTMENT MODE)** 1) GO INTO SERVICE MODE, BY SELECTING THE SERVICE DATA V10 2) ADJUST THE DATA UP/DOWN UNTIL IC801 PIN 2 VOLTAGE BECOME AS SPECIFIED BELOW		
	[CHECKING SPEC] 2.5 ± 0.5 V DC (CHECKING SPEC : 2.50 ± 1.5V)		

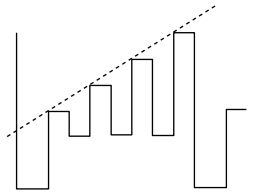
ADJUSTMENT ITEM	RF-AGC		
ADJUSTMENT POSITION	V08	STEP RANGE	0-127
CONTROL	I^2C CONTROL		
PRE-ADJUST REQUIREMENT	OPTION SET UP, BUS SET UP		
CONTENT	US10CH HALF COLOR BAR		
INPUT CONDITION	RF INPUT FIELD STRENGTH **53dBμV** (FIX)		
OUTPUT	TUNER AGC TERMINAL (TP 201) OR CRT DISPLAY CONFIRMATION		
ADJUSTMENT PROCEDURE	**(AT SELF ADJUSTMENT MODE)** 1. GO TO SERVICE MODE 2. GO TO SERVICE DATA **V08**, PRESS R/C TO OPEARATE AUTO-AGC KEY AND CONFIRM THE **OK** DISPLAY ON THE SCREEN. 3. IF APPEAR NG PLS REPEAT STEP 2 AGAIN. **(AT MANUAL ADJUSTMENT MODE)** 1. ADJUST THE V08 BUS DATA UNTIL AGC TERMINAL VOLTAGE BECOME MAXIMUM, THEN DROP 0.1V BELOW MAXIMUM VOLTAGE. 2. CHANGE THE ANTENNA INPUT SIGNAL TO 63-67 dBμV, AND MAKE SURE THERE IS NO NOISE 3. CHANGE THE ANTENNA INPUT SIGNAL TO 90-95 dBμV TO BE SURE THAT THERE IS NO CROSS MODULATION BEAT.		
	[CHECKING SPEC] MAX - 0.1V dc		

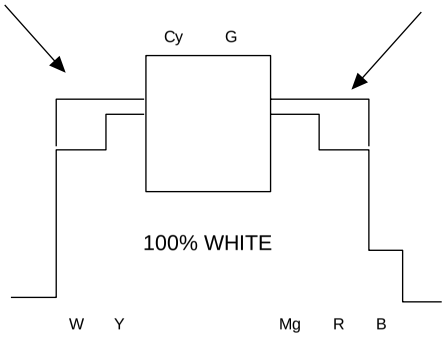
ADJUSTMENT ITEM	SCREEN		
ADJUSTMENT POSITION	V11,V12,V13	STEP RANGE	0-255
CONTROL	I^2C CONTROL		
PRE-ADJUST REQUIREMENT	OPTION SET UP, BUS SET UP		
CONTENT	WINDOW PATTERN OR US4CH LION HEAD		
INPUT CONDITION	220V		
OUTPUT	CONFIRMATION ON CRT DISPLAY		
ADJUSTMENT PROCEDURE	1) IN SERVICE MODE, SET **V04&V11&V12&V13** TO 127; **V14&V15** TO 64, GET IN Y-MUTE BY R/C AND SET **V19** TO “1”, PICTURE APPEAR IN CUT-OFF CONDITION 2) ADJUST THE SCREEN SO THAT CUT-OFF LINE APPEAR IN LOW BRIGHT, THEN JUDGE THAT WHETHER THE CUT-OFF LINE APPEAR IN RED OR GREEN OR BLUE COLOR, IN THIS CONDITION V11=R-CUTOFF, V12=G-CUTOFF, V13=B-CUTOFF, FIX THE DATA OF THE COLOR APPEAR IN CUTOFF LINE AND USE R/C TO ADJUST THE OTHER TWO CUT-OFF DATA SO THAT CUT-OFF LINE COLOR BECOME WHITE. 3) TURN THE SCREEN VR OF FBT SO THAT CUT-OFF LINE JUST DISAPPEAR AND USE R/C TO SET **V19** TO “0”, NEXT DISABLE THE Y-MUTE SO THAT PICTURE APPEAR IN NORMAL MODE.		
	[VOLTAGE CONFIRMATION]		

ADJUSTMENT ITEM	WHITE BALANCE		
ADJUSTMENT POSITION	V14,V15,V11,V12,V13	STEP RANGE	0-127, 0~255
CONTROL	I^2C BUS CONTROL		
PRE-ADJUST REQUIREMENT	OPTION SET UP, BUS SET UP, SCREEN		
CONTENT	23CH 501RE WINDOW PATTERN		
INPUT CONDITION	220V		
OUTPUT	CRT SCREEN DISPLAY.		
ADJUSTMENT PROCEDURE	1) **WHITE** (HIGH BEAM) FIRST LET THE GUN POINT AT **BLACK** POSITION (AS DRAWING ATTACH), ADJ V04 UNTIL **BRIGHTNESS Y** BECOME **5 cd/m2**, THEN LET THE GUN POINT AT **WHITE** POSITION (AS DRAWING ATTACH), ADJUST **V01** UNTIL BRIGHTNESS Y BECOME **150 cd/m2**, ADJUST THE BUS DATA OF **V14** (R DRIVE), **V15**(B DRIVE) UNTIL THE AXIS OF COLOR TEMPERATURE BECOME **X=0.273, Y=0.280** 2) **BLACK** (LOW BEAM) LET THE GUN POINT AT BLACK POSITION, IF THE VALUE SHIFTED AWAY FROM THE DATA ADJUSTED IN STEP 1), ADJUST AGAIN THE TWO SERVICE DATA WHICH HAVE CHOSEN AT SCREEN ADJUST SO THAT TO OBTAIN THE SIMILAR AXIS AS ABOVE. ***WARNING:** DO NOT DISTURB THE MINI STEP GUN DATA DURING THIS ADJUSTMENT. **REPEAT STEP 1), 2) TO GET A REGULATED POSITION.  		
	[CHECKING CONFIRMATION] X=0.273, Y=0.280 (11,600°K + 1 MPCD)		

ADJUSTMENT ITEM	SUB-BRIGHT		
ADJUSTMENT POSITION	V04	STEP RANGE	0-255
CONTROL	I^2C CONTROL		
PRE-ADJUST REQUIREMENT	OPTION SET UP, BUS SET UP, SCREEN, WHITE BALANCE		
CONTENT	WINDOW PATTERN		
INPUT CONDITION	220V		
OUTPUT	CRT SCREEN DISPLAY.		
ADJUSTMENT PROCEDURE	1) LET THE GUN POINT AT BLACK POSITION (AS ATTACH DRAWING), ADJUST V04 BUS DATA UNTIL BRIGHTNESS Y=0.5 cd/m2, **THEN STEP DOWN MORE 4 STEP**  		
	[VOLTAGE CONFIRMATION] BRIGHTNESS Y=0.5 cd/m2, THEN STEP DOWN MORE 4 STEP		

ADJUSTMENT ITEM	SUB-PICTURE		
ADJUSTMENT POSITION	V01	STEP RANGE	0-127
CONTROL	I²C BUS CONTROL		
PRE-ADJUST REQUIREMENT	OPTION SET UP, BUS SET UP, SCREEN, WHITE BALANCE, SUB-BRIGHTNESS		
CONTENT	WINDOW PATTERN		
INPUT CONDITION	220V		
OUTPUT	CRT SCREEN DISPLAY.		
ADJUSTMENT PROCEDURE	1) LET THE GUN POINT AT WHITE POSITION (AS ATTACH DRAWING), ADJUST **V01** BUS DATA UNTIL BRIGHTNESS Y=**150 cd/m2.** **NOTE: ALLOWABLE DATA FOR V01 IS >= 90, EVEN Y CAN'T MATCH THE SPEC**  		
	[VOLTAGER CONFIRMATION] BRIGHTNESS Y=150 cd/m2		

ADJUSTMENT ITEM	SUB-TINT		
ADJUSTMENT POSITION	V02	STEP RANGE	0-127
CONTROL	I²C CONTROL		
PRE-ADJUST REQUIREMENT	OPTION SET UP, BUS SET UP, VCO ADJ, RF-AGC		
CONTENT	US 10 CH HALF COLOR BAR PATTERN		
INPUT CONDITION	220V		
OUTPUT	B-AMP TR BASE (TP853) CONFIRRM WITH OSCILLOSCOPE		
ADJUSTMENT PROCEDURE	1) GET IN Y-MUTE FUNCTION BY R/C. 2) ADJUST THE **V02** BUS DATA TO GET A WAVEFORM AS BELOW. 3) DISABLE THE Y-MUTE **PLS TAKE NOTE THAT SERVICE MODE DATA F53 NEED TO SET +8  B-AMP BASE (TP853) MUST BE IN STEPPING LEVEL		
	[CONFIRMATION]		

ADJUSTMENT ITEM	SUB-COLOR		
ADJUSTMENT POSITION	V03	STEP RANGE	0-127
CONTROL	I^2C BUS CONTROL		
PRE-ADJUST REQUIREMENT	OPTION SET UP, BUS SET UP, VCO ADJ, RF-AGC, **SUB-PICT, SUB-TINT**		
CONTENT	US 10 CH HALF COLOR BAR PATTERN		
INPUT CONDITION	220V		
OUTPUT	R-AMP TR BASE (TP851) CONFIRRM WITH OSCILLOSCOPE		
ADJUSTMENT PROCEDURE	1) SET THE **V03** BUS DATA TO GET A WAVEFORM AS BELOW 2) THIS WAVEFORM SHOWS THAT THE 75% WHITE & RED PORTIONS OF COLOR BAR BEAT AT THE SAME LEVEL *PLEASE TAKE NOTE THAT SERVICE DATA F52 MUST SET TO +10  		
	[CHECKING CONFIRMATION]		

ADJUSTMENT ITEM	X-RAY PROTECTION OPERATING CONFIRMATION		
ADJUSTMENT POSITION	–	STEP RANGE	–
CONTROL	–		
PRE-ADJUST REQUIREMENT	AFTER ALL ADJUSTMENT FINISHED.		
CONTENT	US 4 CH LION HEAD (MONOSCOPE PATTERN)		
INPUT CONDITION	AC 220V, RF INPUT		
OUTPUT	CONFIRMATION BY THE CRT		
ADJUSTMENT PROCEDURE	SET THE USER CONTROL TO SHIPMENT POSITION. **[VOLTAGE CONFIRMATION]** CHECK THE VOLTAGE OF P603 PIN 3 AS SPECIFIED BELOW. **[OPERATION CONFIRMATION]** SUPPLY THE DC VOLTAGE TO P603 PIN 3 AND MAKE SURE THE PROTECTOR IS FUNCTIONED. HORIZONTAL OSCILATION STOP AND PICTURE DISAPPEAR. **[RECOVER INFORMATION]** PULL OUT THE AC CORD. **[CAUTION]** FROM THE RECOVER CONFIRMATION MENTIONED ABOVE, THE AC CODE MUST BE PULLED OUT AT LEAST 4 SECOND BEFORE PLUGGING IN AGAIN.(IN ORDER TO MAKE SURE THE μ-COM HAS BEEN RESET.)		
	[VOLTAGE CONFIRMATION] TP VOLTAGE: **18.9± 1.1V DC** OPERATION VOLTAGE: **24.5V**		

ADJUSTMENT ITEM	HIGH VOLTAGE		
ADJUSTMENT POSITION	–	STEP RANGE	–
CONTROL	–		
PRE-ADJUST REQUIREMENT	AFTER ALL ADJUSTMENT FINISHED.		
CONTENT	US 4 CH LION HEAD (MONOSCOPE PATTERN)		
INPUT CONDITION	AC 220V, RF INPUT		
OUTPUTΩ	CRT ANODE VOLTAGE		
ADJUSTMENT PROCEDURE	SET THE USER CONTROL TO SHIPMENT SETTING POSITION. PUSH ON Y-MUTE BY R/C CONFIRM THE VOLTAGE OF CRT ANODE BY HIGH VOLTAGE METER AND MAKE SURE THE READING IS AS BELOW. **HIGH VOLTAGE** BELOW **30kV** **[CAUTION POINT]** USE ELECTROSTATIC HI-VOLTAGE METER AND FOLLOW THE UL/ DHHS STANDARD TO MAKE CORRECTION AND CONTROL.		

ADJUSTMENT ITEM	MS LEVEL ADJUSTMENT		
ADJUSTMENT POSITION	M01	STEP RANGE	0~15
CONTROL	I^2C BUS CONTROL		
PRE-ADJUST REQUIREMENT	OPTION SET UP, BUS SET UP, VCO ADJ, RF-AGC		
CONTENT	MONORAL SIGNAL (400HZ 100% MODULATION)		
INPUT CONDITION	AC 220V, RF INPUT		
OUTPUT	IC 3001 39 PIN		
ADJUSTMENT PROCEDURE	1) SET THE SOUND VOLUME CONTROL MORE THAN 1. 2) ADJUST BUS DATA OF **M01** UNTIL THE VOLTAGE OF 39 PIN BE-COME AS SPECIFIED BELOW. **[CHECKING SPEC]** 490 ± 10mVrms (CHECKING SPEC :490 ± 20mVrms)		

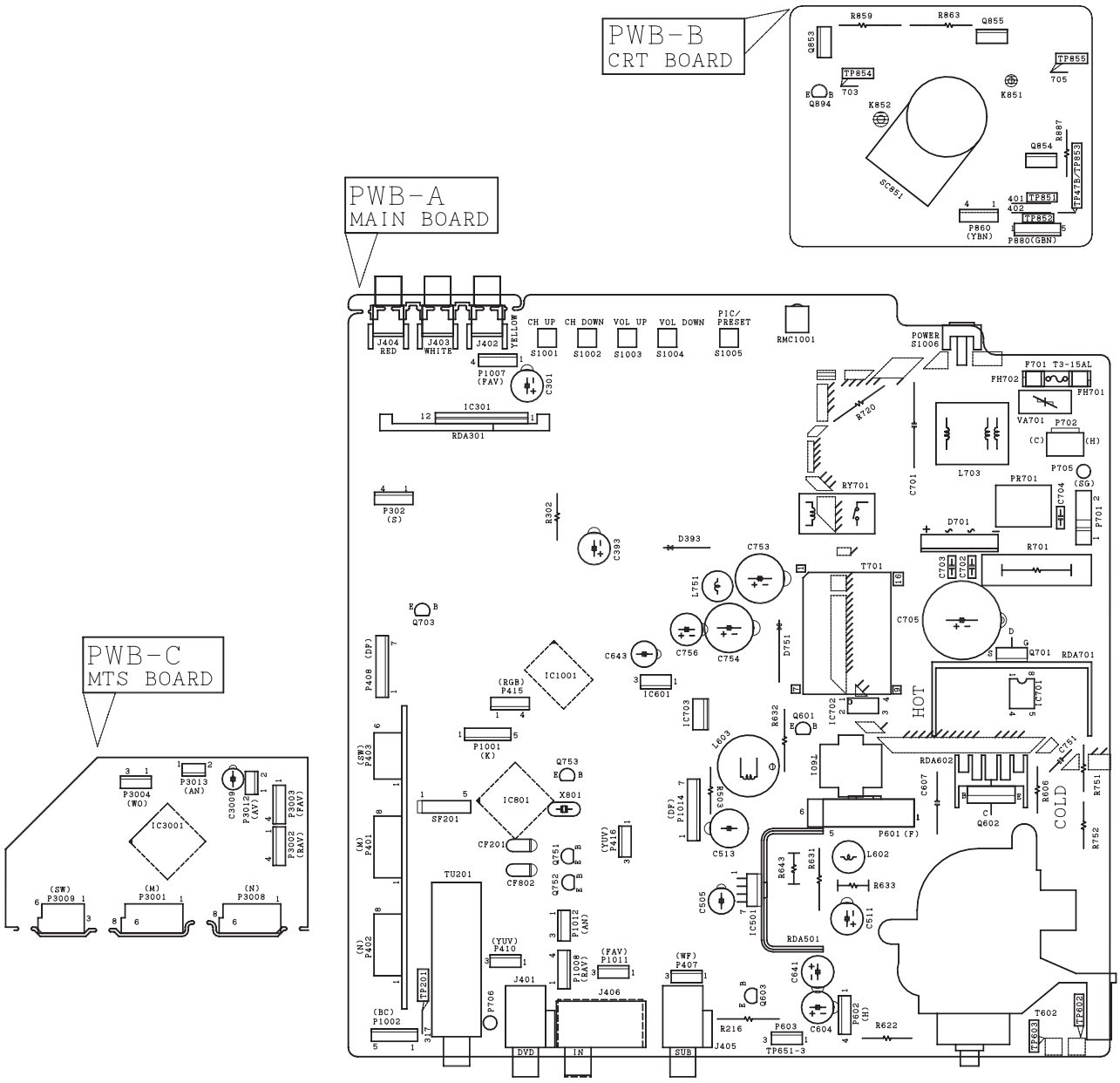
ADJUSTMENT ITEM	MTS+VCO ADJUSTMENT		
ADJUSTMENT POSITION	M02	STEP RANGE	0~63
CONTROL	I^2C BUS CONTROL		
PRE-ADJUST REQUIREMENT	OPTION SET UP, BUS SET UP, VCO ADJ, RF-AGC		
CONTENT	SIGNAL WITHOUT NOISE (SIGNAL WITHOUT SOUND MODULATION)		
INPUT CONDITION	AC 200V		
OUTPUT	IC 3001 39 PIN		
ADJUSTMENT PROCEDURE	1) CONNECT 100 μ F ELECTROLLYTIC CAPACITOR BETWEEN C3005 (-ve)-GND 2) ADJUST THE BUS DATA **M02** UNTIL THE OUTPUT FREQUENCY OF 39 PIN BECOME AS SPECIFIED BELOW. **NOTE: TO MINIMIZE THE PRODUCTION TIME, ITEM 1) CAN IGNORE. IF ITEM 2) CAN'T BE ADJUST, THEN ITEM 1) IS REQUIRE.**		
	[CHECKING SPEC] 62.94 ± 0.75kHz (CHECKING SPEC : 62.94 ± 1.20kHz)		

ADJUSTMENT ITEM	FILTER ADJUSTMENT		
ADJUSTMENT POSITION	M03	STEP RANGE	0~63
CONTROL	I^2C BUS CONTROL		
PRE-ADJUST REQUIREMENT	OPTION SET UP, BUS SET UP, VCO ADJ, RF-AGC, MS-LEVEL, MTS-VCO		
CONTENT	SINE WAVE (9.4kHz, 600mVrms)		
INPUT CONDITION	PIN 14 (FROM C3005 - TERMINAL)		
OUTPUT	CONFIRM BY CRT SCREEN		
ADJUSTMENT PROCEDURE	1) ADJUST **M03** DATA UNITILL **OK** DISPLAY ON SCREEN ADJUST THE BUS DATA IN CENTRE OF THE RANGE.		
	[CHECKING SPEC] REFER TO ABOVE (CHECKING SPEC : ± 2 STEP TO CENTRE)		

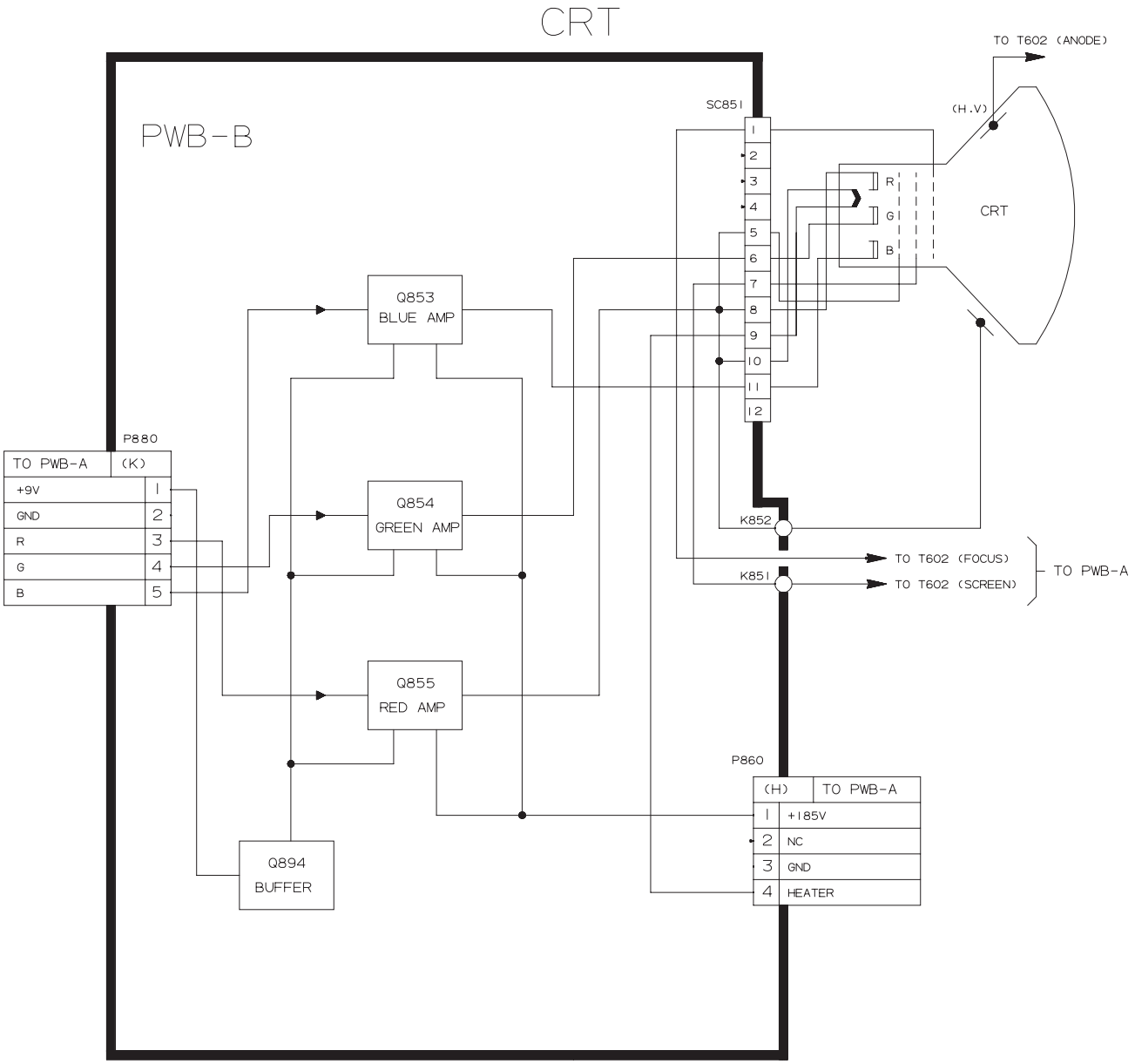
ADJUSTMENT ITEM	SEPARTION ADJUSTMENT		
ADJUSTMENT POSITION	M04, M05	STEP RANGE	0~63
CONTROL	I^2C BUS CONTROL		
PRE-ADJUST REQUIREMENT	OPTION SET UP, BUS SET UP, VCO ADJ, RF-AGC, MS-LEVEL, MTS-VCO, FILTER		
CONTENT	STEREO SIGNAL SIGNAL 1,: MODULATION 30%, L-CH ONLY, NR-ON, 300Hz SIGNAL 2,: MODULATION 30%, L-CH ONLY, NR-ON, 3kHz		
INPUT CONDITION	RF INPUT		
OUTPUT	IC 3001 39 PIN		
ADJUSTMENT PROCEDURE	1) INPUT SIGNAL 1, ADJUST BUS DATA OF M04 UNTIL THE AC VOLTAGE OF 39 PIN BECOME MINIMUM LEVEL. 2) INPUT SIGNAL 2, ADJUST BUS DATA OF M05 UNTIL THE AC VOLTAGE OF 39 PIN BECOME MINIMUM LEVEL. 3) REPEAT STEP 1) AND 2). SET THE SOUND VOLUME TO MAXIMUM THEN MAKE SURE THE READING FROM THE SPEAKER TERMINAL MUST BE OVER THE SPEC AS SPECIFIED BELOW.		
	[CHECKING SPEC] OVER 25 dB (CHECKING SPEC : OVER 20 dB)		

- M E M O -

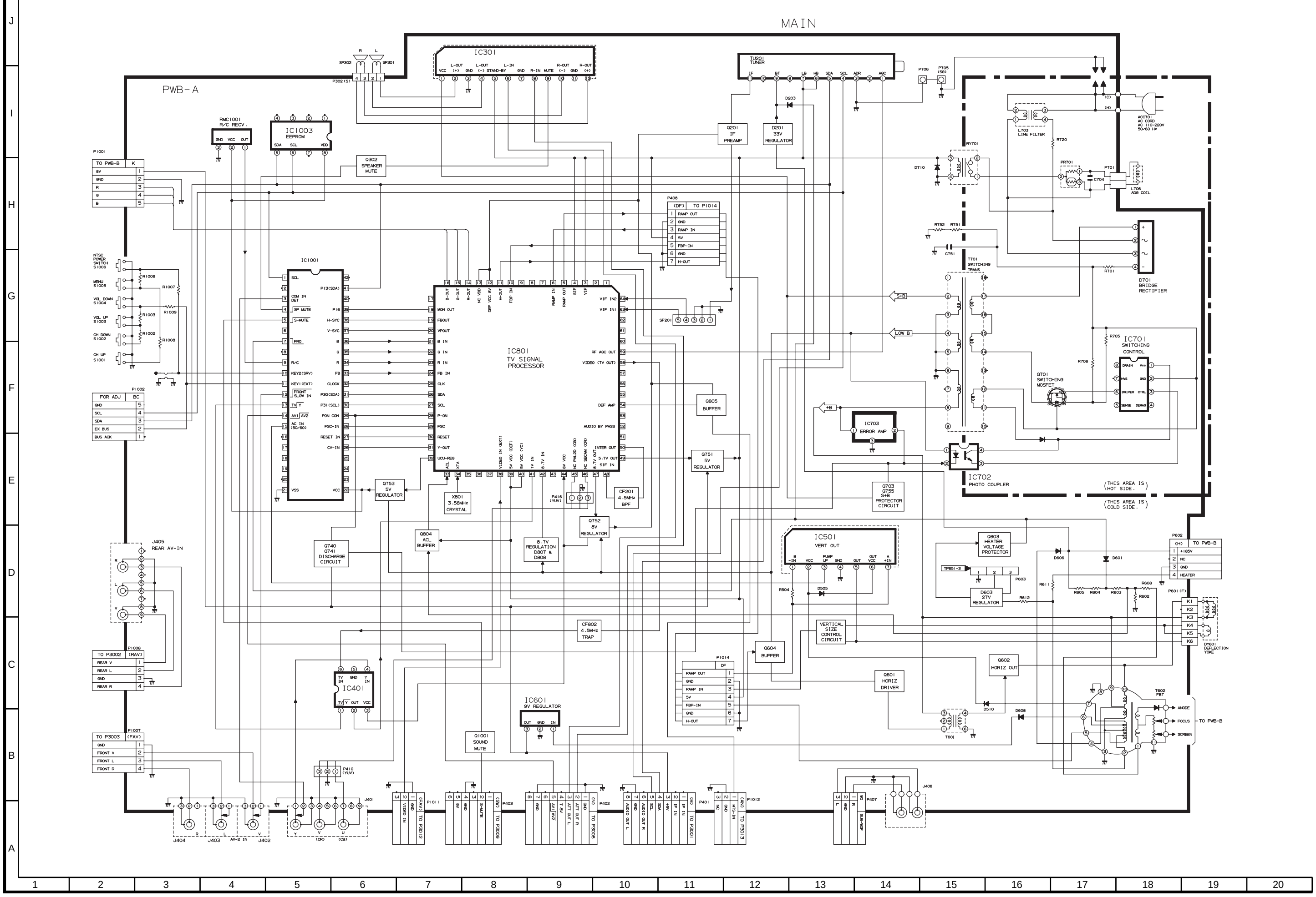
CHASSIS LAYOUT



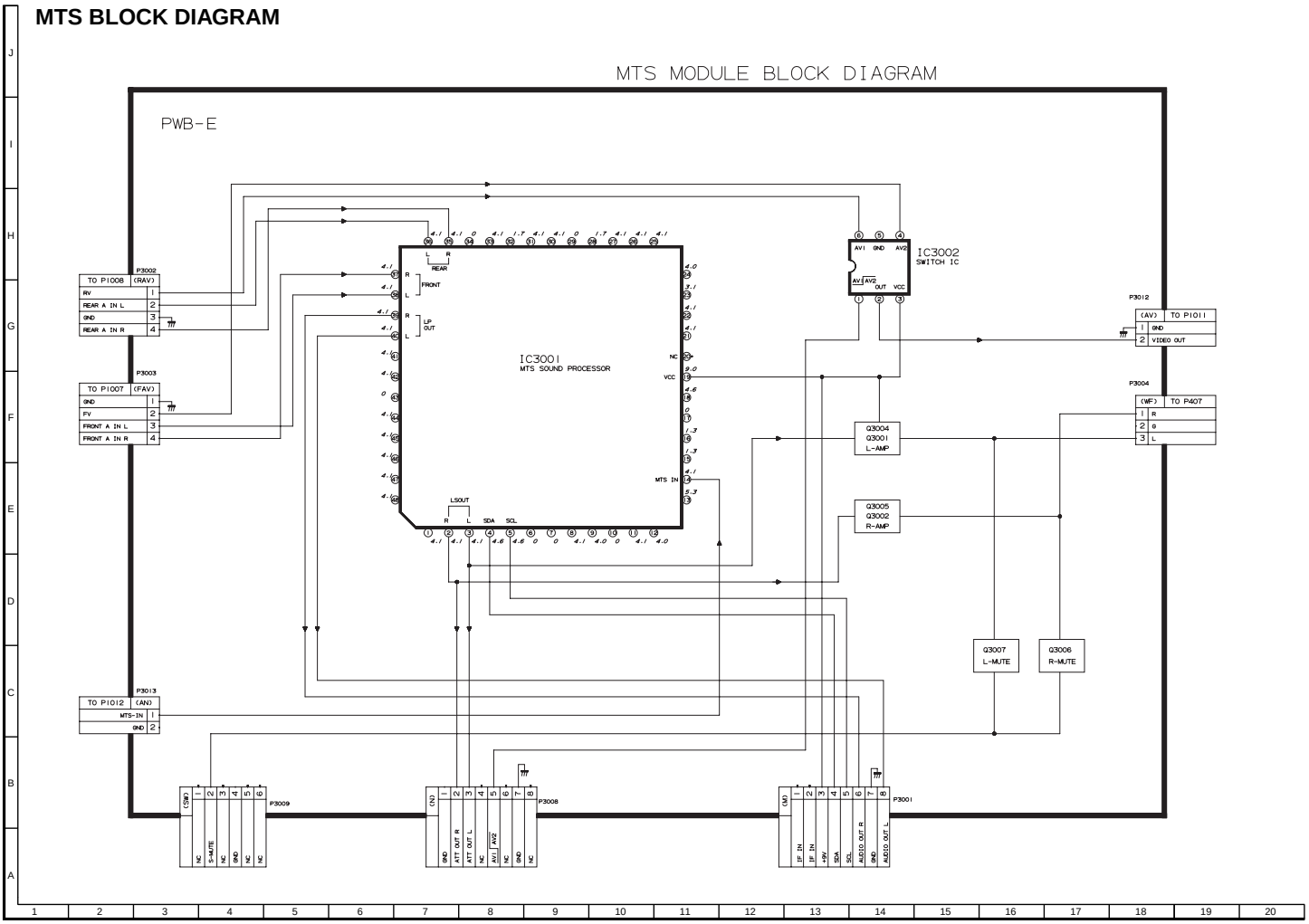
CRT BLOCK DIAGRAM



MAIN BLOCK DIAGRAM


MAIN
PWB-A
IC301
TU201 TUNER
P706
P705 (SG)
SP302
SP301
P302 (S)
RMC1001 R/C RECV.
IC1003 EEPROM
Q302 SPEAKER MUTE
Q201 IF PREAMP
D201 33V REGULATOR
D203
P1001 TO PWB-B (K)
NTSC POWER SWITCH S1006
MENU S1005
VOL DOWN S1004
VOL UP S1003
CH DOWN S1002
CH UP S1001
P1002 FOR ADJ (BC)
IC1001
IC801 TV SIGNAL PROCESSOR
P408 (DF) TO P1014
SF201
Q805 BUFFER
Q751 5V REGULATOR
Q753 5V REGULATOR
X801 3.58MHz CRYSTAL
P416 (YUV)
CF201 4.5MHz BPF
Q752 8V REGULATOR
Q804 ACL BUFFER
8.7V REGULATION D807 & D808
Q740 Q741 DISCHARGE CIRCUIT
CF802 4.5MHz TRAP
J405 REAR AV-IN
P1008 TO P3002 (RAV)
IC401
IC601 9V REGULATOR
Q1001 SOUND MUTE
P1007 TO P3003 (FAV)
P410 (YUV)
J404
J403
AV-2 IN
J402
J401
P1011 (FAV) TO P3012
P403 (SW) TO P3009
P402 (N) TO P3008
P401 (M) TO P3001
P1012 (AN) TO P3013
P407 SUB-WOOF
J406
ACC701 AC CORD AC 110-220V 50/60 Hz
L703 LINE FILTER
R720
RY701
D710
PR701
C704
P701
L706 ADG COIL
R752
R751
C751
T701 SWITCHING TRANS
D701 BRIDGE RECTIFIER
R701
S+B
LOW B
R705
R706
IC701 SWITCHING CONTROL
Q701 SWITCHING MOSFET
+B
IC703 ERROR AMP
IC702 PHOTO COUPLER
(THIS AREA IS HOT SIDE.)
(THIS AREA IS COLD SIDE.)
Q703 Q755 S+B PROTECTOR CIRCUIT
IC501 VERT OUT
Q603 HEATER VOLTAGE PROTECTOR
D606
D601
P602 (H) TO PWB-B
TP651-3
P603
D603 27V REGULATOR
R504
D505
R611
R612
R605
R604
R603
R608
R602
P601 (F)
DY601 DEFLECTION YOKE
VERTICAL SIZE CONTROL CIRCUIT
Q604 BUFFER
P1014 DF
Q602 HORIZ OUT
Q601 HORIZ DRIVER
D510
D608
T601
T602 FBT
ANODE
FOCUS
SCREEN
TO PWB-B

MTS BLOCK DIAGRAM



DESCRIPTION OF SCHEMATIC DIAGRAM

NOTES:

1. *The unit of resistance "ohm" is omitted. (K=kΩ=1000Ω, M=MΩ)*
2. *All resistors are 1/16 watt, unless otherwise noted.*
3. *All capacitors are μF, unless otherwise noted. (P=pF=μμF)*
4. *(G) indicates ±2% tolerance may be used.*
5. *⏚ indicates line isolated ground.*

VOLTAGE MEASUREMENT CONDITIONS:

1. *All DC voltages are measured with DVM connected between points indicated and chassis ground, line voltage set at 120V AC and all controls set for normal picture unless otherwise indicated.*
2. *All voltages measured with 1000μ V B & W or Color signal.*

WAVEFORM MEASUREMENT CONDITIONS:

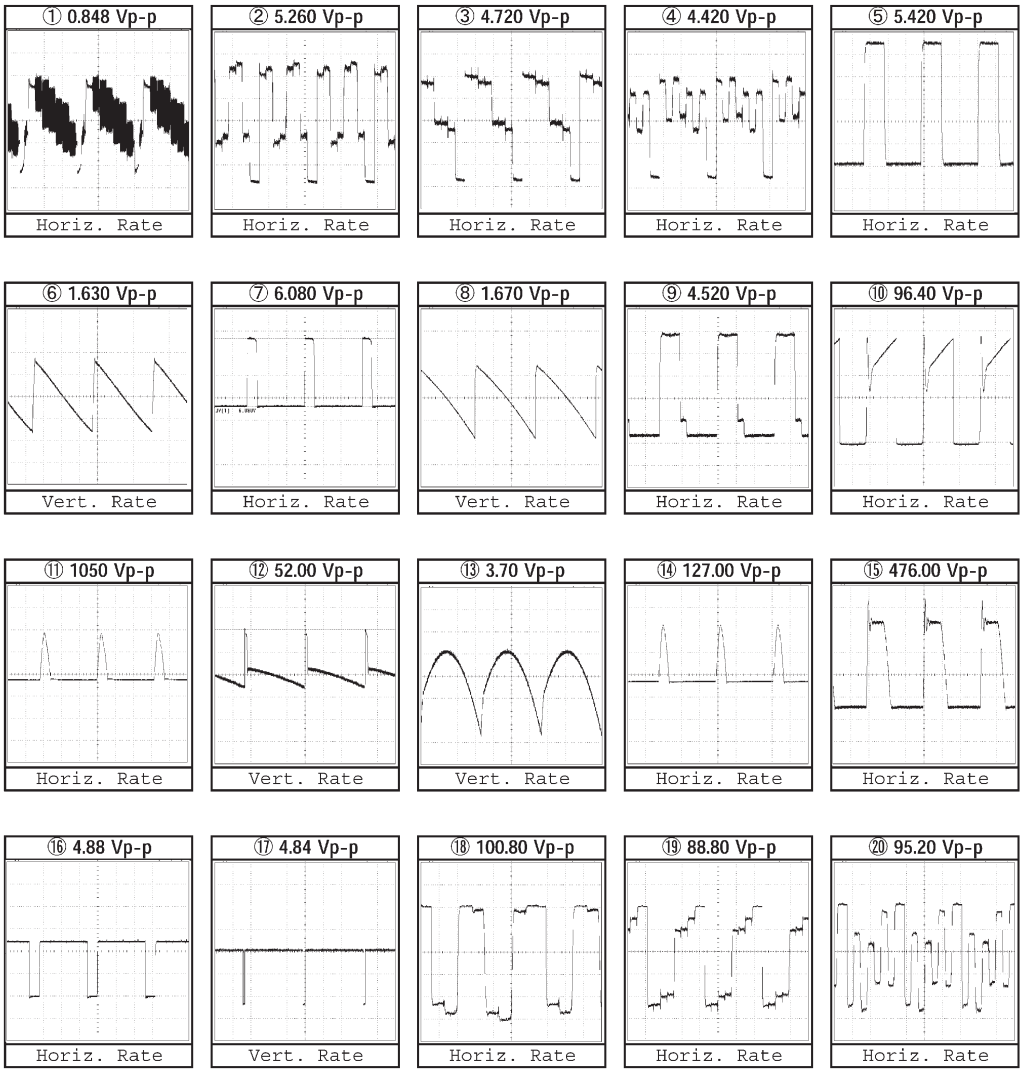
1. *Photographs taken on a standard gated color bar signal, the tint setting adjusted for proper color. The wave shapes at the red, green and blue cathodes of the picture tube depend on the tint, color level and picture control.*
2. *indicates waveform check points (See chart, waveforms are measured from point indicated to chassis ground.)*

⚠ AND SHADED ( ) COMPONENTS = SAFETY RELATED PARTS.
▲ MARK= X-RAY RELATED PARTS.

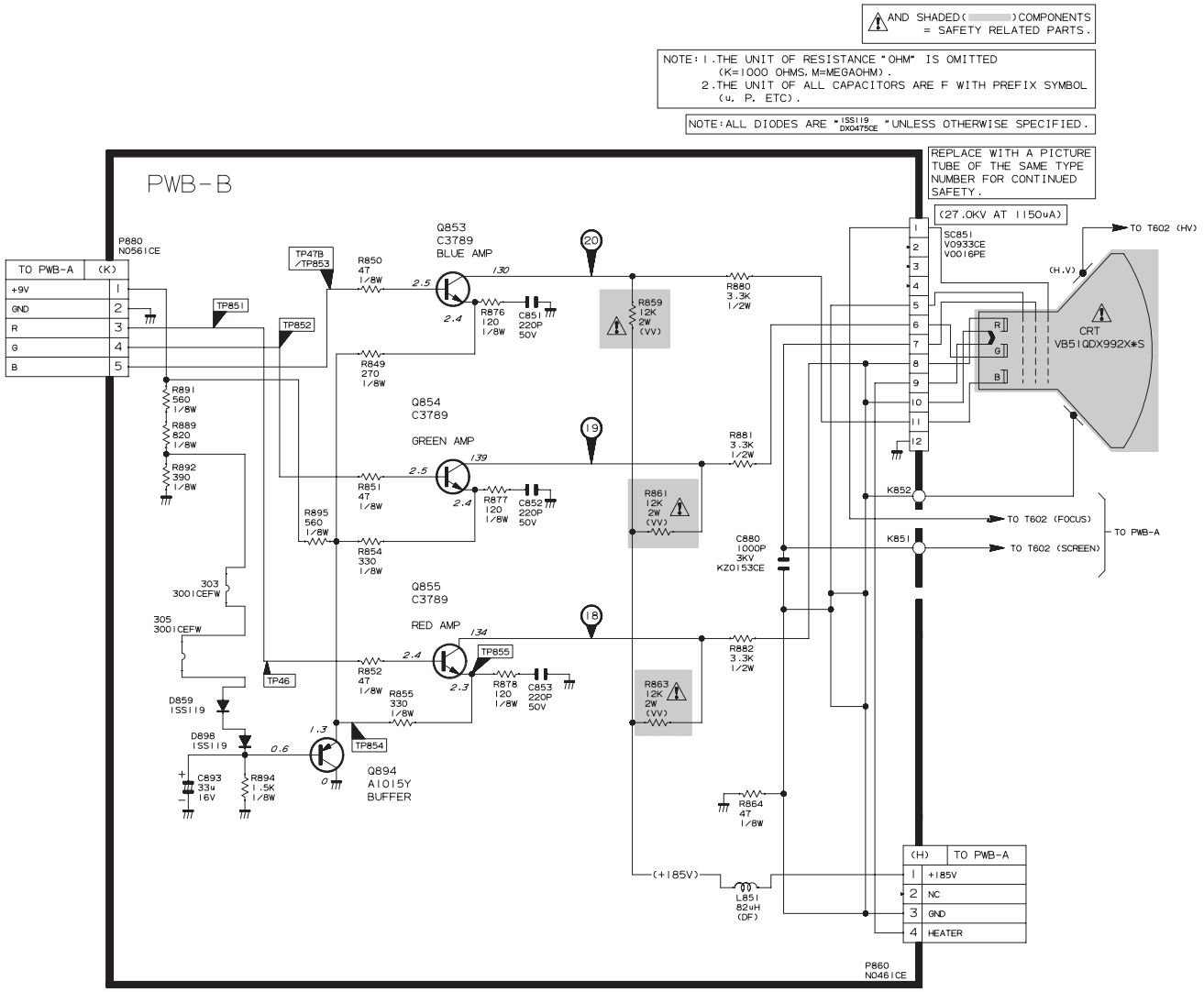
DRGANNES MARQUES ⚠ ET HACHRES ( ): PIECES RELATIVES A LA SECURITE.
MARQUE ▲ : PIECS RELATIVE AUX RAYONS X.

This circuit diagram is a standard one, printed circuits may be subject to change for product improvement without prior notice.

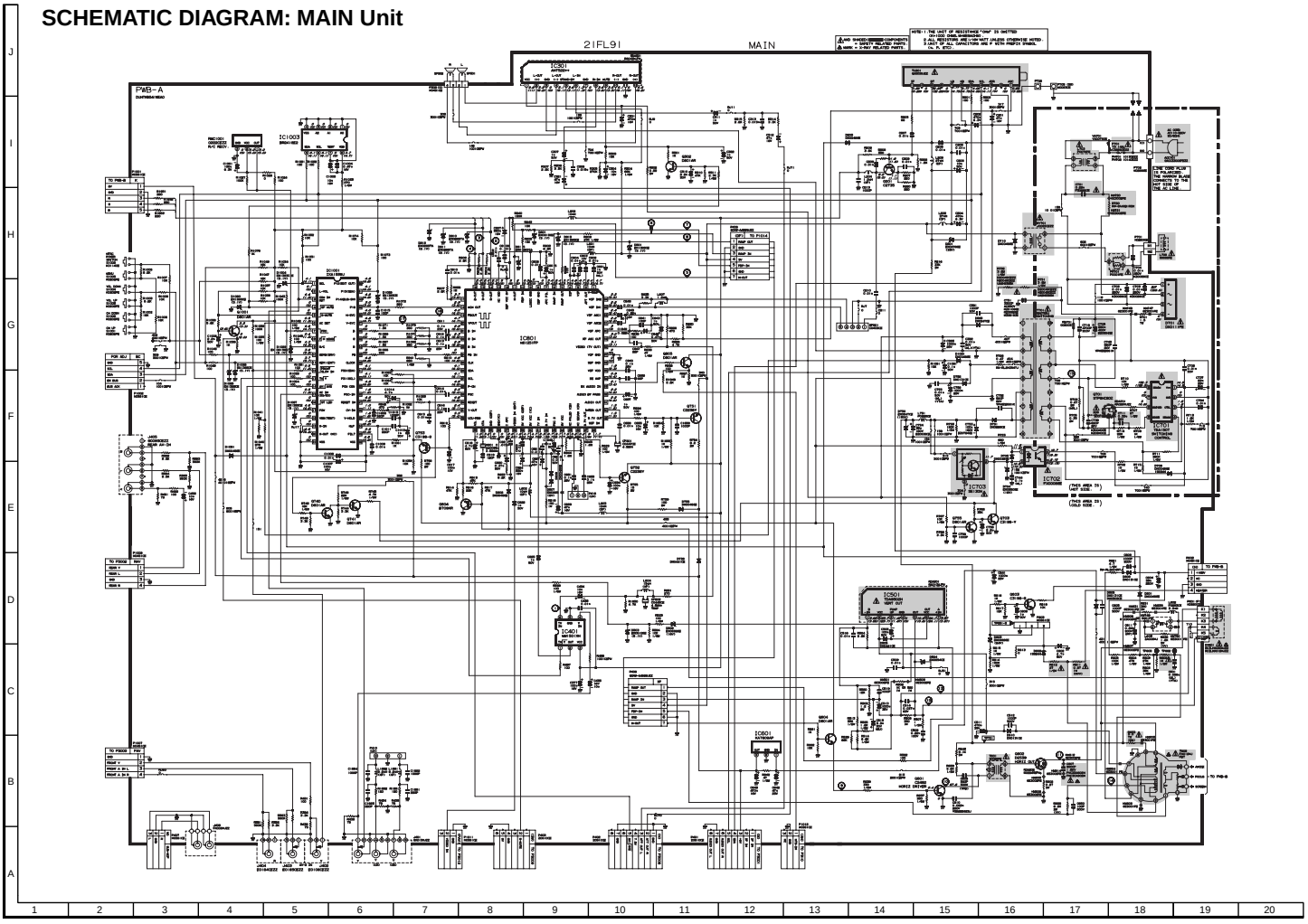
WAVEFORMS



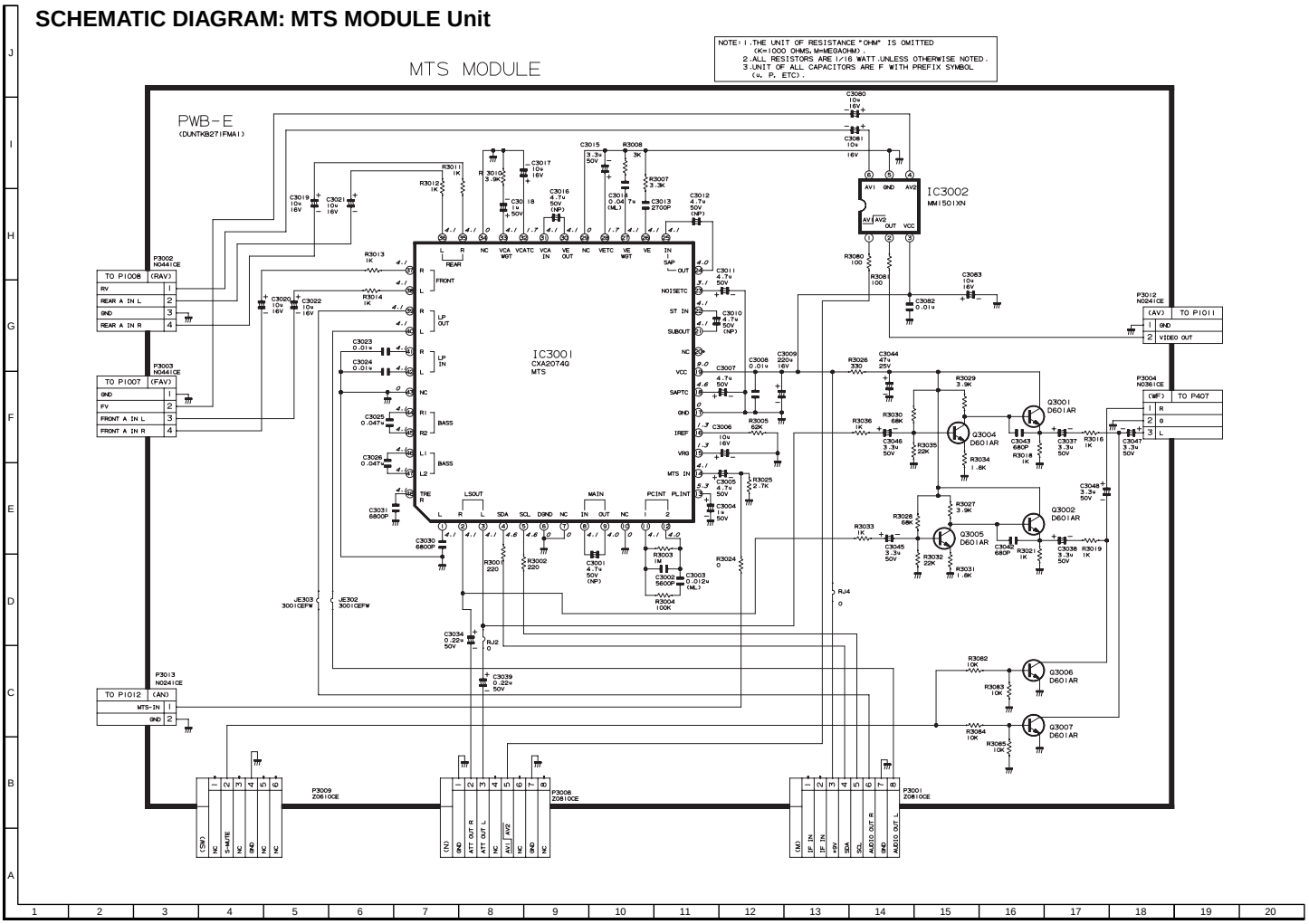
SCHEMATIC DIAGRAM: CRT Unit



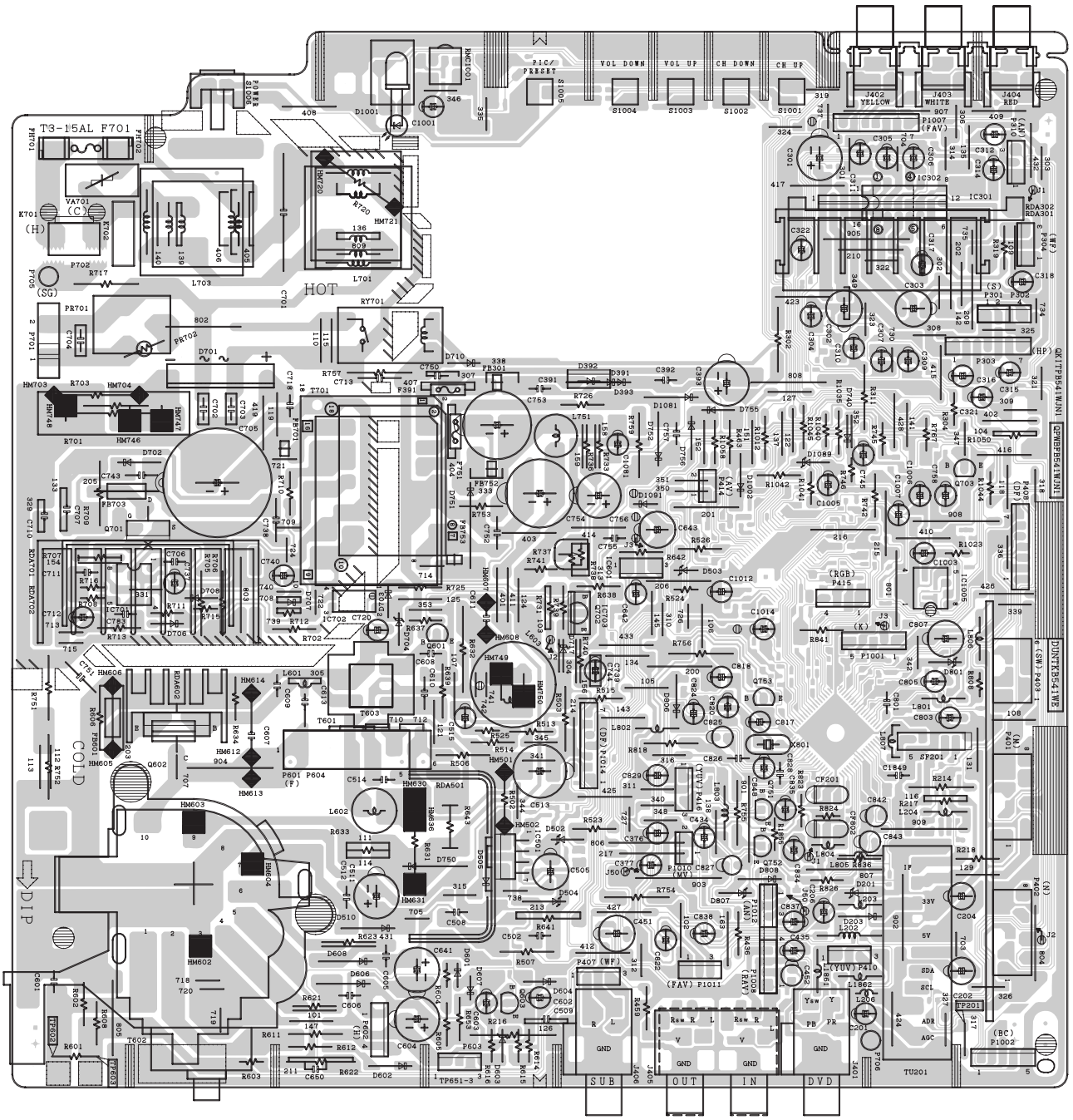
SCHEMATIC DIAGRAM: MAIN Unit



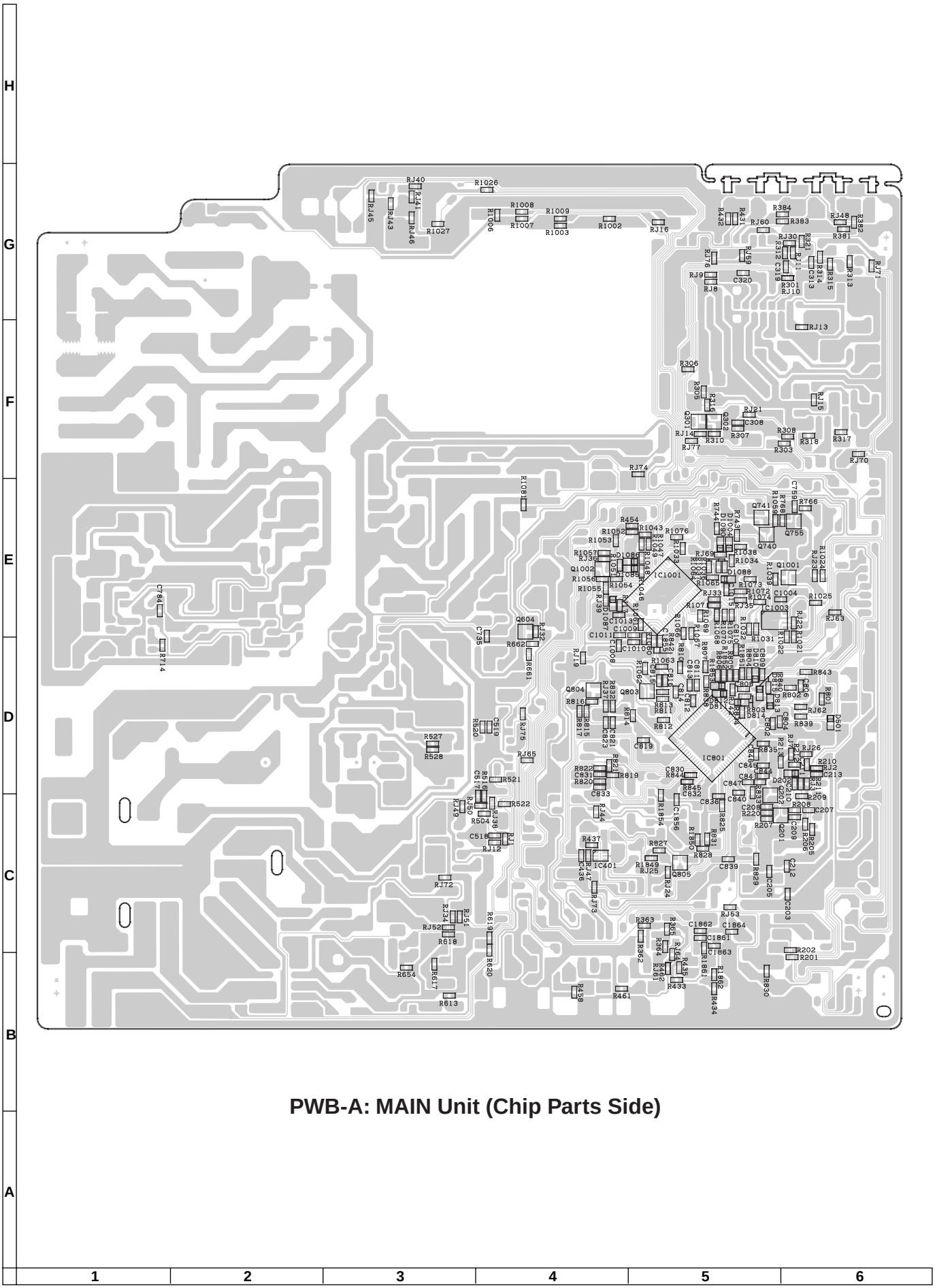
SCHEMATIC DIAGRAM: MTS MODULE Unit



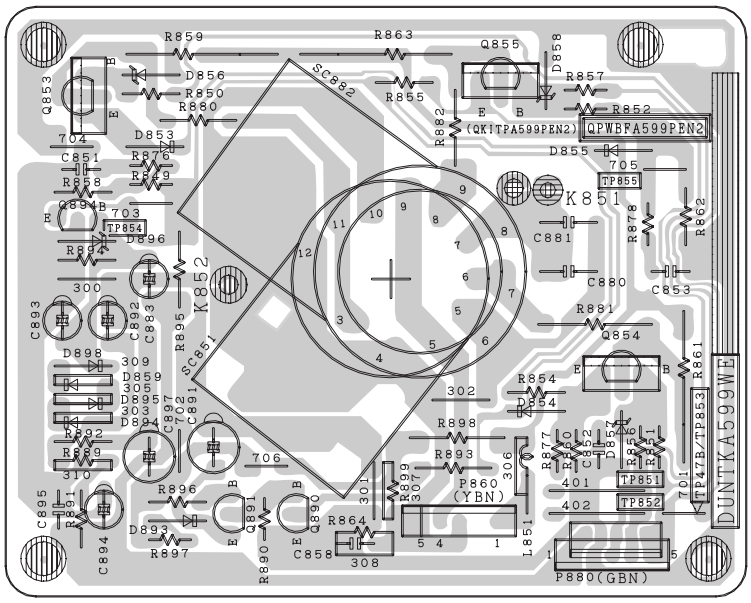
PRINTED WIRING BOARD ASSEMBLIES



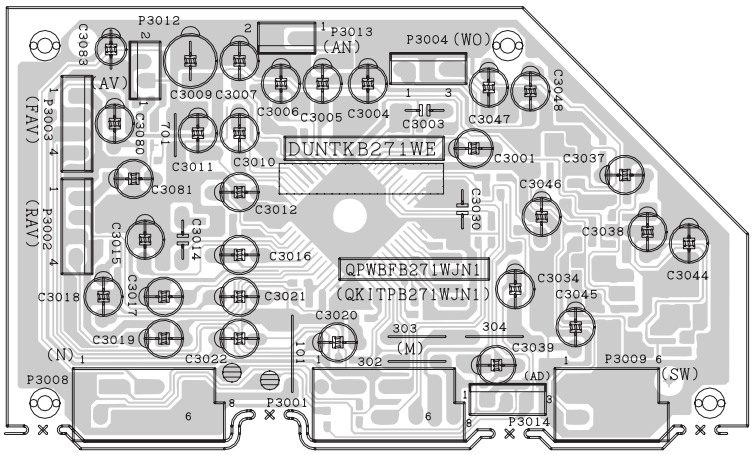
PWB-A: MAIN Unit (Wiring Side)



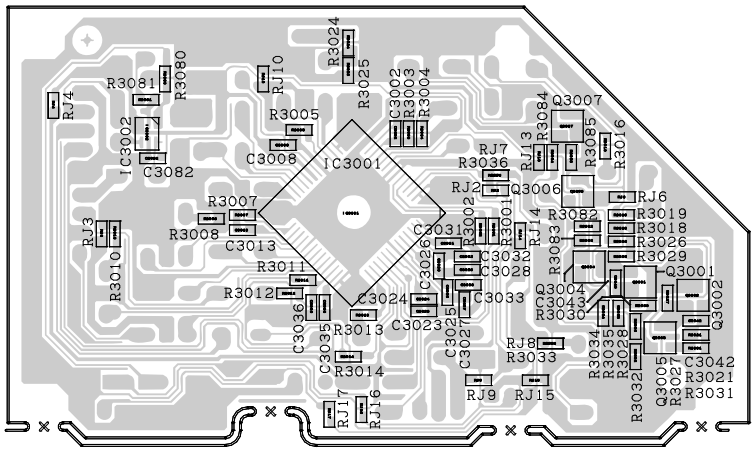
PWB-A: MAIN Unit (Chip Parts Side)



PWB-B: CRT Unit (Wiring Side)



PWB-E: MTS MODULE Unit (Wiring Side)



PWB-E: MTS MODULE Unit (Chip Parts Side)

	1	2	3	4	5	6

REPLACEMENT PARTS LIST

PARTS REPLACEMENT

Replacement parts which have these special safety characteristics are identified in this manual; electrical components having such features are identified by "⚠" in the Replacement Parts Lists.
The use of a substitute replacement part which does not have the same safety characteristics as the factory recommended replacement parts shown in this service manual may create shock, fire or other hazards.

"HOW TO ORDER REPLACEMENT PARTS"

To have your order filled promptly and correctly, please furnish the following informations.

1. **MODEL NUMBER**
2. **REF. NO.**
3. **PART NO.**
4. **DESCRIPTION**

MARK ★: SPARE PARTS-DELIVERY SECTION.

Ref. No.	Part No.	★	Description	Code

PICTURE TUBE

⚠	V101	VB51QDX992X2E	X	Picture Tube	BY
⚠	L706	RCiLG0069PEZZ	X	Degaussing Coil	AH
		QEARCA012WJZZ	X	Grounding Strap	AC
		PMAGF3046CEZZ	X	Purity Magnet, x3	AC
		PSPAG0003PEZZ	X	Spacer, x3	AB

PRINTED WIRING BOARD ASSEMBLIES
(NOT REPLACEMENT ITEM)

PWB-A	DUNTKB541WEA0	-	MAIN Unit	—
PWB-B	DUNTKA599WEA0	-	CRT Unit	—
PWB-E	DUNTKB271WEA1	-	MTS MODULE Unit	—

DUNTKB541WEA0
PWB-A MAIN UNIT

TUNER

NOTE: THE PARTS HERES SHOWN ARE SUPPLIED AS AN ASSEMBLY NOT INDEPENDENTLY.

⚠	TU201	RTUNQA003WJZZ	X	Tuner	AR

INTEGRATED CIRCUITS

	IC301	VHiAN7522++-1	X	AN7522++	AF
	IC401	VHiMM1501XN-1∗	X	MM1501XN	AC
⚠	IC501	VHiTDA9302H-1	X	TDA9302H	AE
	IC601	VHiKA7809AP-1	X	KA7809AP	AB
⚠	IC701	VHiTEA1507/-1	X	TEA1507	AE
⚠	IC703	VHiSE130N//-1	X	SE130N	AF
	IC801	VHiM61251FP1EQ	X	M61251FP	AN
	IC1001	RH-iXA155WJN4	X	IXA155WJ	AP
	IC1003	VHiBR2416E2-1∗	X	BR2416E2	AD

TRANSISTORS

	Q201	VS2SC2735//1E∗	X	2SC2735	AB
	Q302	VS2SD601AR/-1∗	X	2SD601AR	AA
	Q601	VS2SC2482//-1+	X	2SC2482	AB
	Q602	VS2SD2539//1E	X	2SD2539	AG
	Q603	VS2SC3198-G-1+	X	2SC3198-G	AB
	Q604	VS2SD601AR/-1∗	X	2SD601AR	AA
⚠	Q701	VSSTP6NC80Z1E	X	STP6NC80Z	AF
	Q703	VS2SC3198-Y-1+	X	2SC3198-Y	AB
	Q740	VS2SD601AR/-1∗	X	2SD601AR	AA
	Q741	VS2SD601AR/-1∗	X	2SD601AR	AA
	Q751	VS2SC2236Y/-1+	X	2SC2236Y	AB
	Q752	VS2SC2236Y/-1+	X	2SC2236Y	AB
	Q753	VS2SC3198-G-1+	X	2SC3198-G	AB
	Q755	VS2SD601AR/-1∗	X	2SD601AR	AA
	Q804	VS2SB709AR/-1∗	X	2SB709AR	AA
	Q805	VS2SD601AR/-1∗	X	2SD601AR	AA
	Q1001	VS2SD601AR/-1∗	X	2SD601AR	AA

DIODES AND LED

	D201	RH-EX0676GEZZ∗	X	Zener, EX0676GE	AB
	D203	RH-DX0048GEZZ∗	X	DX0048GE	AA
	D393	RH-DX0247CEZZ∗	X	DX0247CE	AB
	D501	RH-EX1393CEZZ∗	X	Zener, EX1393CE	AB
	D502	RH-EX0652GEZZ∗	X	Zener, EX0652GE	AB
	D503	RH-EX0612GEZZ∗	X	Zener, EX0612GE	AB
	D504	RH-EX0654CEZZ∗	X	Zener, EX0654CE	AC
	D505	RH-DX0441CEZZ∗	X	DX0441CE	AA
	D510	RH-DX0131CEZZ∗	X	DX0131CE	AB
	D601	RH-DX0048GEZZ∗	X	DX0048GE	AA
	D602	VHD1SS244//-1∗	X	1SS244	AA
	D603	RH-EX0662GEZZ∗	X	Zener, EX0662GE	AB
	D606	RH-DX0131CEZZ∗	X	DX0131CE	AB
	D608	RH-DX0131CEZZ∗	X	DX0131CE	AB
⚠	D701	RH-DX0111PEZZ	X	DX0111PE	AC
	D703	RH-DX0048GEZZ∗	X	DX0048GE	AA
	D704	RH-EX0650GEZZ∗	X	Zener, EX0650GE	AB
	D708	RH-DX0048GEZZ∗	X	DX0048GE	AA
	D710	RH-DX0048GEZZ∗	X	DX0048GE	AA
	D750	RH-EX0647CEZZ∗	X	Zener, EX0647CE	AE
	D751	RH-DX0229CEZZ	X	DX0229CE	AB
	D752	RH-DX0131CEZZ∗	X	DX0131CE	AB
	D755	RH-DX0048GEZZ∗	X	DX0048GE	AA
	D756	RH-DX0441CEZZ∗	X	DX0441CE	AA
	D801	RH-EX0613GEZZ∗	X	Zener, EX0613GE	AB
	D806	RH-DX0048GEZZ∗	X	DX0048GE	AA
	D807	RH-EX0625GEZZ∗	X	Zener, EX0625GE	AB
	D808	RH-DX0048GEZZ∗	X	DX0048GE	AA
	D810	RH-EX0263TAZZ∗	X	Zener, EX0263TA	AB
	D811	RH-EX0263TAZZ∗	X	Zener, EX0263TA	AB
	D812	RH-EX0263TAZZ∗	X	Zener, EX0263TA	AB
	D813	RH-EX1393CEZZ∗	X	Zener, EX1393CE	AB
	D815	RH-EX0263TAZZ∗	X	Zener, EX0263TA	AB
	D1004	RH-EX1393CEZZ∗	X	Zener, EX1393CE	AB
	D1081	RH-DX0048GEZZ∗	X	DX0048GE	AA
	D1085	RH-EX1393CEZZ∗	X	Zener, EX1393CE	AB
	D1086	RH-EX1393CEZZ∗	X	Zener, EX1393CE	AB
	D1087	RH-EX1393CEZZ∗	X	Zener, EX1393CE	AB
	D1088	RH-EX1393CEZZ∗	X	Zener, EX1393CE	AB
	D1089	RH-EX0613GEZZ∗	X	Zener, EX0613GE	AB
	D1090	RH-EX1393CEZZ∗	X	Zener, EX1393CE	AB
	D1091	RH-DX0048GEZZ∗	X	DX0048GE	AA
⚠	IC702	RH-FX0008GEZZ	X	PC123FY8	AB
	VA701	RH-VX0073CEZZ	X	Varistor	AB

PACKAGED CIRCUITS

⚠	PR701	RMPTP0001PEZZ	X	Packaged Circuit	AE
⚠	R751	RR-DZ0049CEZZ∗	X	Resistor	AB
⚠	R752	RR-DZ0049CEZZ∗	X	Resistor	AB
	X801	RCRSAA009WJZZ	X	Crystal, CRSAA009WJ	AC

FILTERS

	CF201	RFiLC0447CEZZ	X	Filter, FiLC0447CE	AB
	CF802	RFiLC0446CEZZ	X	Filter, FiLC0446CE	AB
	SF201	RFiLC0405CEZZ	X	Filter, FiLC0405CE	AD

COILS

	L202	VP-CF270K0000∗	X	Peaking, 27μH 10%	AB
	L203	VP-DF270K0000∗	X	Peaking, 27μH 10%	AA

Ref. No.	Part No.	★	Description	Code
L204	VP-XF1R2K0000∗	X	Peaking, 1.2µH 10%	AA
L602	RCiLP0223CEZZ	X	Coil, CiLP0223CE	AB
L603	RCiLZA006WJZZ	X	Coil, CiLZA006WJ	AE
⚠ L703	RCiLF0078PEZZ	X	Coil, CiLF0078PE	AC
L751	RCiLP0225CEZZ	X	Coil, CiLP0225CE	AB
L801	VP-DF100K0000∗	X	Peaking, 10µH 10%	AA
L802	VP-DF100K0000∗	X	Peaking, 10µH 10%	AA
L803	VP-DF100K0000∗	X	Peaking, 10µH 10%	AA
L804	VP-XF150K0000∗	X	Peaking, 15µH 10%	AA
L806	VP-DF100K0000∗	X	Peaking, 10µH 10%	AA
L807	VP-XF1R2K0000∗	X	Peaking, 1.2µH 10%	AA
L1861	VP-XF8R2K0000∗	X	Peaking, 8.2µH 10%	AA
L1862	VP-XF8R2K0000∗	X	Peaking, 8.2µH 10%	AA

TRANSFORMERS

⚠ T601	RTRNZ0026PEZZ	X	Transformer	AD
⚠ T602	RTRNFA012WJZZ	X	H-Volt Transformer	AU
⚠ T701	RTRNWA076WJZZ	X	Transformer	AG

CAPACITORS

C201	VCEA0A1CW476M+	X	47	16V	Electrolytic	AA
C202	VCEA0A0JW477M+	X	470	6.3V	Electrolytic	AB
C203	VCKYCY1HF103Z∗	X	0.01	50V	Ceramic	AA
C204	VCEA0A0JW477M+	X	470	6.3V	Electrolytic	AB
C205	VCKYCY1HF103Z∗	X	0.01	50V	Ceramic	AA
C206	VCEA0A1HW106M+	X	10	50V	Electrolytic	AA
C207	VCKYCY1HF103Z∗	X	0.01	50V	Ceramic	AA
C208	VCKYCY1HF103Z∗	X	0.01	50V	Ceramic	AA
C209	VCKYCY1HF103Z∗	X	0.01	50V	Ceramic	AA
C210	VCKYCY1HF103Z∗	X	0.01	50V	Ceramic	AA
C213	VCKYCY1HB102K∗	X	1000p	50V	Ceramic	AA
C301	VCEA0A1CW477M+	X	470	16V	Electrolytic	AB
C304	VCEA0A1CW106M+	X	10	16V	Electrolytic	AA
C307	VCEA0A1HW105M+	X	1	50V	Electrolytic	AA
C308	VCKYCY1HF153Z∗	X	0.015	50V	Ceramic	AA
C310	VCEA0A1HW225M+	X	2.2	50V	Electrolytic	AA
C311	VCEA0A1HW105M+	X	1	50V	Electrolytic	AA
C312	VCEA0A1CW476M+	X	47	16V	Electrolytic	AA
C313	VCKYCY1HF153Z∗	X	0.015	50V	Ceramic	AA
C321	VCEA0A1CW476M+	X	47	16V	Electrolytic	AA
C322	VCEA0A1HW105M+	X	1	50V	Electrolytic	AA
C377	VCEA0A1CW107M+	X	100	16V	Electrolytic	AA
C391	VCKYPA1HB102K+	X	1000p	50V	Ceramic	AA
C392	VCQYTA1HM103J+	X	0.01	50V	Mylar	AA
C393	VCEA0A1EW108M+	X	1000	25V	Electrolytic	AB
C434	VCEA0A1CW106M+	X	10	16V	Electrolytic	AA
C435	VCE9GA1CW106M+	X	10	16V	Electrolytic	AB
C436	VCKYCY1HF103Z∗	X	0.01	50V	Ceramic	AA
C452	VCEA9M1CW106M+	X	10	16V	Electrolytic	AA
C505	VCEA0A1HW107M+	X	100	50V	Electrolytic	AB
C508	VCFYAA2AA224J+	X	0.22	100V	Metallized Polypro Film	AC
C509	VCKYD41CY103N∗	X	0.01	16V	Ceramic	AA
C511	VCEA0A1VW477M+	X	470	35V	Electrolytic	AB
C512	VCKYPA2HB102K+	X	1000p	500V	Ceramic	AB
C513	VCEA0A1VW108M+	X	1000	35V	Electrolytic	AA
C514	VCFYSA1JB273J+	X	0.027	63V	Metallized Polypro Film	AB
C515	VCEACA1HC335J+	X	3.3	50V	Electrolytic	AB
C518	VCKYCY1HF103Z∗	X	0.01	50V	Ceramic	AA
C519	VCKYCY1HB102K∗	X	1000p	50V	Ceramic	AA
C601	VCQYTA1HM563J+	X	0.056	50V	Mylar	AA
C602	VCEA0A1HW475M+	X	4.7	50V	Electrolytic	AA
C603	VCEA0A1HW105M+	X	1	50V	Electrolytic	AA
C604	VCEA0A2EW336M+	X	33	250V	Electrolytic	AB
C605	VCKYPA2HB102K+	X	1000p	500V	Ceramic	AB
C606	VCKYPA2HB102K+	X	1000p	500V	Ceramic	AB
⚠ C607	VCFPVC3ZA902H	X	9000p	1800V	Metallized Polypro Film	AB
C608	VCKYPA2HB561K+	X	560p	500V	Ceramic	AB
C610	VCFYSB2EB823J	X	0.082	250V	Metallized Polypro Film	AB
C611	VCFPVC2DB244J	X	0.24	200V	Metallized Polypro Film	AB
C641	VCEA0A1EW108M+	X	1000	25V	Electrolytic	AB
C642	VCEA0A1EW476M+	X	47	25V	Electrolytic	AA
C643	VCEA0A1CW477M+	X	470	16V	Electrolytic	AB
C650	VCKYPA2HB101K+	X	100p	500V	Ceramic	AB
⚠ C701	RC-FZ029SCEZZ	X	0.22	275V	Metallized Polypro Film	AB
C702	RC-KZ0029CEZZ+	X	0.01	250V	Ceramic	AB
C703	RC-KZ0029CEZZ+	X	0.01	250V	Ceramic	AB
C704	RC-KZ0029CEZZ	X	0.01	250V	Ceramic	AB
⚠ C705	RC-EZ0804CEZZ	X	220	400V	Electrolytic	AH
C706	VCQYTA1HM103J+	X	0.01	50V	Mylar	AA
C711	VCFYFA1HA334J+	X	0.33	50V	Metallized Polypro Film	AB
C718	VCKYPA2HB472K+	X	4700p	500V	Ceramic	AB
C737	VCEA0A1EW226M+	X	22	25V	Electrolytic	AA
C738	RC-KZ0040CEZZ	X	820p	2kV	Ceramic	AB
C743	VCKYPH3DB561K	X	560p	2000V	Ceramic	AB
C744	VCQYTA1HM104J+	X	0.1	50V	Mylar	AB
C751	RC-KZ0106GEZZ	X	0.0033	250V	Ceramic	AB
C752	VCKYPH3DB561K	X	560p	2000V	Ceramic	AB
C753	RC-EZ0724CEZZ	X	100	160V	Electrolytic	AC
C754	RC-EZ0638CEZZ	X	33	160V	Electrolytic	AD
C755	VCQYTA1HM103J+	X	0.01	50V	Mylar	AA
C756	VCEA0A1EW108M+	X	1000	25V	Electrolytic	AB
C758	VCEA0A1HW225M+	X	2.2	50V	Electrolytic	AA
C759	VCKYCY1HB102K∗	X	1000p	50V	Ceramic	AA
C784	VCKYCY1HB103K∗	X	0.01	50V	Ceramic	AA
C801	VCFYFA1HA105J+	X	1	50V	Metallized Polypro Film	AB
C802	VCKYCY1HF103Z∗	X	0.01	50V	Ceramic	AA
C803	VCEA0A1AW476M+	X	47	10V	Electrolytic	AA
C804	VCKYCY1HF103Z∗	X	0.01	50V	Ceramic	AA
C805	VCEA0A1HW105M+	X	1	50V	Electrolytic	AA
C806	VCKYCY1HF103Z∗	X	0.01	50V	Ceramic	AA
C807	VCEA0A1CW337M+	X	330	16V	Electrolytic	AB
C808	VCKYCY1HF103Z∗	X	0.01	50V	Ceramic	AA
C809	VCKYCY1HF103Z∗	X	0.01	50V	Ceramic	AA
C810	VCKYCY1HF103Z∗	X	0.01	50V	Ceramic	AA
C811	VCKYCY1EF104Z∗	X	0.1	25V	Ceramic	AA
C812	VCKYCY1EF104Z∗	X	0.1	25V	Ceramic	AA
C813	VCKYCY1EF104Z∗	X	0.1	25V	Ceramic	AA
C814	VCKYCY1HF103Z∗	X	0.01	50V	Ceramic	AA
C815	VCKYCY1HF103Z∗	X	0.01	50V	Ceramic	AA
C816	VCKYCY1EF104Z∗	X	0.1	25V	Ceramic	AA
C817	VCEA0A1AW107M+	X	100	10V	Electrolytic	AA
C818	VCEA0A1HW475M+	X	4.7	50V	Electrolytic	AA
C819	VCCCCY1HH121J∗	X	120p	50V	Ceramic	AA
C820	VCEA0A1HW474M+	X	0.47	50V	Electrolytic	AA
C821	VCKYCY1HF153Z∗	X	0.015	50V	Ceramic	AA
C822	VCE9GA1HW105M+	X	1	50V	Electrolytic	AB
C823	VCKYCY1HF103Z∗	X	0.01	50V	Ceramic	AA
C824	VCEA0A1CW337M+	X	330	16V	Electrolytic	AB
C825	VCE9EM1HW105M+	X	1	50V	Electrolytic	AB
C826	VCKYPA1HF103Z+	X	0.01	50V	Ceramic	AA
C827	VCEA9M1CW476M+	X	47	16V	Electrolytic	AA
C828	VCKYPA1HB103K+	X	0.01	50V	Ceramic	AB
C829	VCEA0A1CW476M+	X	47	16V	Electrolytic	AA
C831	VCKYCY1EF104Z∗	X	0.1	25V	Ceramic	AA
C833	VCKYCY1EF104Z∗	X	0.1	25V	Ceramic	AA
C834	VCEA0A1CW107M+	X	100	16V	Electrolytic	AA
C835	VCEA0A1CW106M+	X	10	16V	Electrolytic	AA
C836	VCKYCY1HF103Z∗	X	0.01	50V	Ceramic	AA
C837	VCEA0A1HW105M+	X	1	50V	Electrolytic	AA
C839	VCCCCY1HH680J∗	X	68p	50V	Ceramic	AA
C840	VCKYCY1EF104Z∗	X	0.1	25V	Ceramic	AA
C841	VCCCCY1HH101J∗	X	100p	50V	Ceramic	AA
C842	VCEA9M1HW474M+	X	0.47	50V	Electrolytic	AA
C843	VCEA9M1HW105M+	X	1	50V	Electrolytic	AA
C845	VCKYCY1CF224Z∗	X	0.22	16V	Ceramic	AA
C846	VCKYCY1HF103Z∗	X	0.01	50V	Ceramic	AA
C847	VCCCCY1HH220J∗	X	22p	50V	Ceramic	AA
C848	VCEA0A1HW105M+	X	1	50V	Electrolytic	AA
C1001	VCEA0A0JW107M+	X	100	6.3V	Electrolytic	AA
C1003	VCEA0A1CW106M+	X	10	16V	Electrolytic	AA
C1004	VCKYCY1CF474Z∗	X	0.47	16V	Ceramic	AA
C1006	VCEA0A1HW225M+	X	2.2	50V	Electrolytic	AA
C1007	VCEA0A1CW107M+	X	100	16V	Electrolytic	AA
C1008	VCKYCY1HF103Z∗	X	0.01	50V	Ceramic	AA

Ref. No.	Part No.	★	Description			Code
C1009	VCKYCY1HF103Z∗	X	0.01	50V	Ceramic	AA
C1011	VCKYCY1HB221K∗	X	220p	50V	Ceramic	AA
C1012	VCEA0A1HW105M+	X	1	50V	Electrolytic	AA
C1013	VCKYCY1HB102K∗	X	1000p	50V	Ceramic	AA
C1014	VCEA0A1HW475M+	X	4.7	50V	Electrolytic	AA
C1015	VCCCCY1HH101J∗	X	100p	50V	Ceramic	AA
C1081	VCEA0A1HW104M+	X	0.1	50V	Electrolytic	AA
C1849	VCFYFA1HA223J+	X	0.022	50V	Metallized Polypro Film	AA
C1855	VCKYCY1HB561K∗	X	560p	50V	Ceramic	AA
C1856	VCKYCY1HB102K∗	X	1000p	50V	Ceramic	AA
C1861	VCCCCY1HH221J∗	X	220p	50V	Ceramic	AA
C1862	VCKYCY1HB102K∗	X	1000p	50V	Ceramic	AA
C1863	VCCCCY1HH221J∗	X	220p	50V	Ceramic	AA
C1864	VCKYCY1HB102K∗	X	1000p	50V	Ceramic	AA

RESISTORS

C211	VRS-CY1JF000J∗	X	0	1/16W	Metal Oxide	AA
RJ1	VRS-CY1JF000J∗	X	0	1/16W	Metal Oxide	AA
RJ2	VRS-CY1JF000J∗	X	0	1/16W	Metal Oxide	AA
RJ3	VRS-CY1JF000J∗	X	0	1/16W	Metal Oxide	AA
RJ4	VRS-CY1JF000J∗	X	0	1/16W	Metal Oxide	AA
RJ7	VRS-CY1JF000J∗	X	0	1/16W	Metal Oxide	AA
RJ9	VRS-CY1JF000J∗	X	0	1/16W	Metal Oxide	AA
RJ10	VRS-CY1JF000J∗	X	0	1/16W	Metal Oxide	AA
RJ11	VRS-CY1JF000J∗	X	0	1/16W	Metal Oxide	AA
RJ13	VRS-CY1JF000J∗	X	0	1/16W	Metal Oxide	AA
RJ14	VRS-CY1JF000J∗	X	0	1/16W	Metal Oxide	AA
RJ15	VRS-CY1JF000J∗	X	0	1/16W	Metal Oxide	AA
RJ16	VRS-CY1JF000J∗	X	0	1/16W	Metal Oxide	AA
RJ17	VRS-CY1JF000J∗	X	0	1/16W	Metal Oxide	AA
RJ19	VRS-CY1JF000J∗	X	0	1/16W	Metal Oxide	AA
RJ22	VRS-CY1JF000J∗	X	0	1/16W	Metal Oxide	AA
RJ23	VRS-CY1JF000J∗	X	0	1/16W	Metal Oxide	AA
RJ33	VRS-CY1JF000J∗	X	0	1/16W	Metal Oxide	AA
RJ35	VRS-CY1JF000J∗	X	0	1/16W	Metal Oxide	AA
RJ37	VRS-CY1JF000J∗	X	0	1/16W	Metal Oxide	AA
RJ39	VRS-CY1JF000J∗	X	0	1/16W	Metal Oxide	AA
RJ41	VRS-CY1JF000J∗	X	0	1/16W	Metal Oxide	AA
RJ42	VRS-CY1JF000J∗	X	0	1/16W	Metal Oxide	AA
RJ43	VRS-CY1JF000J∗	X	0	1/16W	Metal Oxide	AA
RJ47	VRS-CY1JF000J∗	X	0	1/16W	Metal Oxide	AA
RJ50	VRS-CY1JF000J∗	X	0	1/16W	Metal Oxide	AA
RJ51	VRS-CY1JF000J∗	X	0	1/16W	Metal Oxide	AA
RJ52	VRS-CY1JF000J∗	X	0	1/16W	Metal Oxide	AA
RJ53	VRS-CY1JF000J∗	X	0	1/16W	Metal Oxide	AA
RJ60	VRS-CY1JF000J∗	X	0	1/16W	Metal Oxide	AA
RJ62	VRS-CY1JF000J∗	X	0	1/16W	Metal Oxide	AA
RJ63	VRS-CY1JF000J∗	X	0	1/16W	Metal Oxide	AA
RJ65	VRS-CY1JF000J∗	X	0	1/16W	Metal Oxide	AA
RJ69	VRS-CY1JF000J∗	X	0	1/16W	Metal Oxide	AA
RJ70	VRS-CY1JF000J∗	X	0	1/16W	Metal Oxide	AA
RJ71	VRS-CY1JF000J∗	X	0	1/16W	Metal Oxide	AA
RJ72	VRS-CY1JF000J∗	X	0	1/16W	Metal Oxide	AA
RJ75	VRS-CY1JF000J∗	X	0	1/16W	Metal Oxide	AA
RJ76	VRS-CY1JF000J∗	X	0	1/16W	Metal Oxide	AA
R201	VRS-CY1JF101J∗	X	100	1/16W	Metal Oxide	AA
R202	VRS-CY1JF101J∗	X	100	1/16W	Metal Oxide	AA
R205	VRS-CY1JF680J∗	X	68	1/16W	Metal Oxide	AA
R206	VRS-CY1JF122J∗	X	1.2k	1/16W	Metal Oxide	AA
R207	VRS-CY1JF221J∗	X	220	1/16W	Metal Oxide	AA
R208	VRS-CY1JF331J∗	X	330	1/16W	Metal Oxide	AA
R209	VRS-CY1JF392J∗	X	3.9k	1/16W	Metal Oxide	AA
R216	VRS-VV3LB333J	X	33k	3W	Metal Oxide	AB
R220	VRS-CY1JF221J∗	X	220	1/16W	Metal Oxide	AA
R301	VRS-CY1JF102J∗	X	1k	1/16W	Metal Oxide	AA
R302	VRN-RL3DBR22J+	X	0.22	2W	Metal Film	AB
R303	VRS-CY1JF103J∗	X	10k	1/16W	Metal Oxide	AA
R304	VRD-RA2BE683J∗	X	68k	1/8W	Carbon	AA
R305	VRS-CY1JF274J∗	X	270k	1/16W	Metal Oxide	AA
R307	VRS-CY1JF222J∗	X	2.2k	1/16W	Metal Oxide	AA
R308	VRS-CY1JF332J∗	X	3.3k	1/16W	Metal Oxide	AA
R310	VRS-CY1JF473J∗	X	47k	1/16W	Metal Oxide	AA
R311	VRD-RA2BE272J∗	X	2.7k	1/8W	Carbon	AA
R314	VRS-CY1JF332J∗	X	3.3k	1/16W	Metal Oxide	AA
R315	VRS-CY1JF222J∗	X	2.2k	1/16W	Metal Oxide	AA

Ref. No.	Part No.	★	Description			Code
R362	VRS-CY1JF332J∗	X	3.3k	1/16W	Metal Oxide	AA
R363	VRS-CY1JF564J∗	X	560k	1/16W	Metal Oxide	AA
R364	VRS-CY1JF332J∗	X	3.3k	1/16W	Metal Oxide	AA
R365	VRS-CY1JF564J∗	X	560k	1/16W	Metal Oxide	AA
R381	VRS-CY1JF564J∗	X	560k	1/16W	Metal Oxide	AA
R382	VRS-CY1JF332J∗	X	3.3k	1/16W	Metal Oxide	AA
R383	VRS-CY1JF564J∗	X	560k	1/16W	Metal Oxide	AA
R384	VRS-CY1JF332J∗	X	3.3k	1/16W	Metal Oxide	AA
R431	VRS-CY1JF101J∗	X	100	1/16W	Metal Oxide	AA
R432	VRS-CY1JF750J∗	X	75	1/16W	Metal Oxide	AA
R433	VRS-CY1JF750J∗	X	75	1/16W	Metal Oxide	AA
R434	VRS-CY1JF750J∗	X	75	1/16W	Metal Oxide	AA
R435	VRS-CY1JF750J∗	X	75	1/16W	Metal Oxide	AA
R437	VRS-CY1JF101J∗	X	100	1/16W	Metal Oxide	AA
R461	VRS-CY1JF750J∗	X	75	1/16W	Metal Oxide	AA
R462	VRS-CY1JF101J∗	X	100	1/16W	Metal Oxide	AA
R502	VRS-RG3AB102J+	X	1k	1W	Metal Oxide	AB
R503	VRN-RL3DB1R2J+	X	1.2	2W	Metal Film	AB
R504	VRS-CY1JF222J∗	X	2.2k	1/16W	Metal Oxide	AA
R506	VRS-RG3AB331J+	X	330	1W	Metal Oxide	AB
R507	VRD-RM2HD1R0J∗	X	1	1/2W	Carbon	AA
R513	VRD-RM2HD333J∗	X	33k	1/2W	Carbon	AA
R514	VRD-RM2HD682J∗	X	6.8k	1/2W	Carbon	AA
R520	VRS-CY1JF123J∗	X	12k	1/16W	Metal Oxide	AA
R522	VRS-CY1JF101J∗	X	100	1/16W	Metal Oxide	AA
R523	VRD-RA2BE101J∗	X	100	1/8W	Carbon	AA
R524	VRD-RA2BE103J∗	X	10k	1/8W	Carbon	AA
R525	VRD-RA2BE122J∗	X	1.2k	1/8W	Carbon	AA
R526	VRD-RA2BE101J∗	X	100	1/8W	Carbon	AA
R528	VRS-CY1JF683J∗	X	68k	1/16W	Metal Oxide	AA
R602	VRD-RA2BE393J∗	X	39k	1/8W	Carbon	AA
R603	VRD-RA2BE273J∗	X	27k	1/8W	Carbon	AA
R604	VRD-RA2BE473J∗	X	47k	1/8W	Carbon	AA
R605	VRD-RM2HD104J∗	X	100k	1/2W	Carbon	AA
R606	VRN-RL3LBR27J+	X	0.27	3W	Metal Film	AB
⚠ R608	VRD-RM2HD102J∗	X	1k	1/2W	Carbon	AA
⚠ R611	VRN-RL3ABR27J+	X	0.27	1W	Metal Film	AB
⚠ R612	VRD-RM2HD270J∗	X	27	1/2W	Carbon	AA
R613	VRS-CY1JF000J∗	X	0	1/16W	Metal Oxide	AA
R614	VRD-RA2BE154J∗	X	150k	1/8W	Carbon	AA
R615	VRD-RA2BE102J∗	X	1k	1/8W	Carbon	AA
R616	VRD-RA2BE102J∗	X	1k	1/8W	Carbon	AA
R617	VRS-CY1JF123J∗	X	12k	1/16W	Metal Oxide	AA
R618	VRS-CY1JF103J∗	X	10k	1/16W	Metal Oxide	AA
R621	VRN-RL2HC4R7J+	X	4.7	1/2W	Metal Film	AB
R622	VRS-VV3DB682J	X	6.8k	2W	Metal Oxide	AA
R631	VRS-KT3LB391J	X	390	3W	Metal Oxide	AB
R632	VRS-RG3LB122J+	X	1.2k	3W	Metal Oxide	AB
⚠ R633	VRS-KA3NG3R3K	X	3.3	7W	Metal Oxide	AB
R637	VRD-RA2BE331J∗	X	330	1/8W	Carbon	AA
R638	VRD-RA2BE331J∗	X	330	1/8W	Carbon	AA
R639	VRD-RM2HD562J∗	X	5.6k	1/2W	Carbon	AA
R642	VRD-RM2HD470J∗	X	47	1/2W	Carbon	AA
R643	VRS-KA3HG912J	X	9.1k	5W	Metal Oxide	AB
R661	VRS-CY1JF102J∗	X	1k	1/16W	Metal Oxide	AA
R662	VRS-CY1JF103J∗	X	10k	1/16W	Metal Oxide	AA
R701	VRW-KQ3NC1R5K	X	1.5	7W	Cement	AB
R702	VRD-RM2HD100J∗	X	10	1/2W	Carbon	AA
R705	VRN-VV3DBR33J	X	0.33	2W	Metal Film	AB
R706	VRN-VV3DBR27J	X	0.27	2W	Metal Film	AB
R707	VRD-RM2HD270J∗	X	27	1/2W	Carbon	AA
R708	VRD-RA2BE102J∗	X	1k	1/8W	Carbon	AA
R710	VRS-RG2HC103J+	X	10k	1/2W	Metal Oxide	AB
R711	VRD-RA2BE394J∗	X	390k	1/8W	Carbon	AA
R713	VRD-RM2HD122J∗	X	1.2k	1/2W	Carbon	AA
R715	VRD-RA2BE150J∗	X	15	1/8W	Carbon	AA
R716	VRD-RA2BE223J∗	X	22k	1/8W	Carbon	AA
⚠ R720	VRW-GA4AB1R5K	X	1.5	10W	Cement	AC
R725	VRD-RM2HD821J∗	X	820	1/2W	Carbon	AA
R726	VRN-RL2HCR47J+	X	0.47	1/2W	Metal Film	AB
R742	VRD-RA2BE183J∗	X	18k	1/8W	Carbon	AA
R743	VRS-CY1JF332J∗	X	3.3k	1/16W	Metal Oxide	AA
R744	VRS-CY1JF332J∗	X	3.3k	1/16W	Metal Oxide	AA
R745	VRD-RA2BE472J∗	X	4.7k	1/8W	Carbon	AA
R746	VRD-RA2BE223J∗	X	22k	1/8W	Carbon	AA
R753	VRD-RM2HD124J∗	X	120k	1/2W	Carbon	AA

Ref. No.	Part No.	★				Code
R754	VRN-RL3DB8R2J+	X	8.2	2W	Metal Film	AB
R755	VRS-RG3DB150J+	X	15	2W	Metal Oxide	AB
R756	VRS-RG3DB121J+	X	120	2W	Metal Oxide	AB
R759	VRS-RG3DB101J+	X	100	2W	Metal Oxide	AB
R766	VRS-CY1JF333J∗	X	33k	1/16W	Metal Oxide	AA
R767	VRD-RA2BE103J∗	X	10k	1/8W	Carbon	AA
R768	VRS-CY1JF332J∗	X	3.3k	1/16W	Metal Oxide	AA
R802	VRS-CY1JF682J∗	X	6.8k	1/16W	Metal Oxide	AA
R803	VRS-CY1JF103J∗	X	10k	1/16W	Metal Oxide	AA
R804	VRS-CY1JF222J∗	X	2.2k	1/16W	Metal Oxide	AA
R805	VRS-CY1JF222J∗	X	2.2k	1/16W	Metal Oxide	AA
R806	VRS-CY1JF222J∗	X	2.2k	1/16W	Metal Oxide	AA
R807	VRS-CY1JF222J∗	X	2.2k	1/16W	Metal Oxide	AA
R808	VRD-RA2BE273J∗	X	27k	1/8W	Carbon	AA
R810	VRS-CY1JF101J∗	X	100	1/16W	Metal Oxide	AA
R812	VRS-CY1JF101J∗	X	100	1/16W	Metal Oxide	AA
R814	VRS-CY1JF473J∗	X	47k	1/16W	Metal Oxide	AA
R815	VRS-CY1JF473J∗	X	47k	1/16W	Metal Oxide	AA
R816	VRS-CY1JF223J∗	X	22k	1/16W	Metal Oxide	AA
R817	VRS-CY1JF473J∗	X	47k	1/16W	Metal Oxide	AA
R818	VRS-RG3AB151J+	X	150	1W	Metal Oxide	AB
R823	VRD-RA2BE101J∗	X	100	1/8W	Carbon	AA
R824	VRD-RA2BE101J∗	X	100	1/8W	Carbon	AA
R826	VRD-RA2BE101J∗	X	100	1/8W	Carbon	AA
R827	VRS-CY1JF102J∗	X	1k	1/16W	Metal Oxide	AA
R828	VRS-CY1JF471J∗	X	470	1/16W	Metal Oxide	AA
R829	VRS-CY1JF472J∗	X	4.7k	1/16W	Metal Oxide	AA
R830	VRS-CY1JF393J∗	X	39k	1/16W	Metal Oxide	AA
R831	VRS-CY1JF271J∗	X	270	1/16W	Metal Oxide	AA
R832	VRS-CY1JF822J∗	X	8.2k	1/16W	Metal Oxide	AA
R833	VRS-CY1JF101J∗	X	100	1/16W	Metal Oxide	AA
R835	VRS-CY1JF332J∗	X	3.3k	1/16W	Metal Oxide	AA
R836	VRD-RA2BE470J∗	X	47	1/8W	Carbon	AA
R838	VRS-CY1JF105J∗	X	1M	1/16W	Metal Oxide	AA
R839	VRS-CY1JF101J∗	X	100	1/16W	Metal Oxide	AA
R840	VRS-CY1JF124J∗	X	120k	1/16W	Metal Oxide	AA
R841	VRD-RA2BE821J∗	X	820	1/8W	Carbon	AA
R842	VRS-CY1JF471J∗	X	470	1/16W	Metal Oxide	AA
R843	VRS-CY1JF103J∗	X	10k	1/16W	Metal Oxide	AA
R844	VRS-CY1JF185J∗	X	1.8M	1/16W	Metal Oxide	AA
R845	VRS-CY1JF185J∗	X	1.8M	1/16W	Metal Oxide	AA
R1002	VRS-CY1JF183J∗	X	18k	1/16W	Metal Oxide	AA
R1003	VRS-CY1JF822J∗	X	8.2k	1/16W	Metal Oxide	AA
R1006	VRS-CY1JF822J∗	X	8.2k	1/16W	Metal Oxide	AA
R1007	VRS-CY1JF103J∗	X	10k	1/16W	Metal Oxide	AA
R1008	VRS-CY1JF183J∗	X	18k	1/16W	Metal Oxide	AA
R1009	VRS-CY1JF103J∗	X	10k	1/16W	Metal Oxide	AA
R1021	VRS-CY1JF101J∗	X	100	1/16W	Metal Oxide	AA
R1022	VRS-CY1JF101J∗	X	100	1/16W	Metal Oxide	AA
R1023	VRD-RA2BE271J∗	X	270	1/8W	Carbon	AA
R1024	VRS-CY1JF101J∗	X	100	1/16W	Metal Oxide	AA
R1026	VRS-CY1JF000J∗	X	0	1/16W	Metal Oxide	AA
R1027	VRS-CY1JF104J∗	X	100k	1/16W	Metal Oxide	AA
R1031	VRS-CY1JF101J∗	X	100	1/16W	Metal Oxide	AA
R1032	VRS-CY1JF103J∗	X	10k	1/16W	Metal Oxide	AA
R1034	VRS-CY1JF103J∗	X	10k	1/16W	Metal Oxide	AA
R1035	VRD-RA2BE101J∗	X	100	1/8W	Carbon	AA
R1036	VRS-CY1JF103J∗	X	10k	1/16W	Metal Oxide	AA
R1037	VRS-CY1JF103J∗	X	10k	1/16W	Metal Oxide	AA
R1038	VRS-CY1JF562J∗	X	5.6k	1/16W	Metal Oxide	AA
R1039	VRS-CY1JF102J∗	X	1k	1/16W	Metal Oxide	AA
R1040	VRD-RA2BE273J∗	X	27k	1/8W	Carbon	AA
R1041	VRD-RA2BE103J∗	X	10k	1/8W	Carbon	AA
R1042	VRD-RA2BE101J∗	X	100	1/8W	Carbon	AA
R1043	VRS-CY1JF104J∗	X	100k	1/16W	Metal Oxide	AA
R1045	VRD-RA2BE101J∗	X	100	1/8W	Carbon	AA
R1046	VRS-CY1JF101J∗	X	100	1/16W	Metal Oxide	AA
R1047	VRS-CY1JF183J∗	X	18k	1/16W	Metal Oxide	AA
R1048	VRS-CY1JF101J∗	X	100	1/16W	Metal Oxide	AA
R1049	VRS-CY1JF183J∗	X	18k	1/16W	Metal Oxide	AA
R1051	VRS-CY1JF101J∗	X	100	1/16W	Metal Oxide	AA
R1052	VRS-CY1JF104J∗	X	100k	1/16W	Metal Oxide	AA
R1053	VRS-CY1JF101J∗	X	100	1/16W	Metal Oxide	AA
R1054	VRS-CY1JF101J∗	X	100	1/16W	Metal Oxide	AA
R1059	VRS-CY1JF103J∗	X	10k	1/16W	Metal Oxide	AA
R1061	VRS-CY1JF102J∗	X	1k	1/16W	Metal Oxide	AA
R1062	VRS-CY1JF105J∗	X	1M	1/16W	Metal Oxide	AA
R1063	VRS-CY1JF103J∗	X	10k	1/16W	Metal Oxide	AA
R1064	VRS-CY1JF103J∗	X	10k	1/16W	Metal Oxide	AA
R1065	VRS-CY1JF103J∗	X	10k	1/16W	Metal Oxide	AA
R1066	VRS-CY1JF561J∗	X	560	1/16W	Metal Oxide	AA
R1067	VRS-CY1JF152J∗	X	1.5k	1/16W	Metal Oxide	AA
R1068	VRS-CY1JF331J∗	X	330	1/16W	Metal Oxide	AA
R1069	VRS-CY1JF152J∗	X	1.5k	1/16W	Metal Oxide	AA
R1070	VRS-CY1JF331J∗	X	330	1/16W	Metal Oxide	AA
R1071	VRS-CY1JF152J∗	X	1.5k	1/16W	Metal Oxide	AA
R1072	VRS-CY1JF221J∗	X	220	1/16W	Metal Oxide	AA
R1073	VRS-CY1JF101J∗	X	100	1/16W	Metal Oxide	AA
R1074	VRS-CY1JF103J∗	X	10k	1/16W	Metal Oxide	AA
R1075	VRS-CY1JF331J∗	X	330	1/16W	Metal Oxide	AA
R1076	VRS-CY1JF102J∗	X	1k	1/16W	Metal Oxide	AA
R1081	VRS-CY1JF103J∗	X	10k	1/16W	Metal Oxide	AA
R1849	VRS-CY1JF222J∗	X	2.2k	1/16W	Metal Oxide	AA
R1850	VRS-CY1JF472J∗	X	4.7k	1/16W	Metal Oxide	AA
R1851	VRS-CY1JF221J∗	X	220	1/16W	Metal Oxide	AA
R1852	VRS-CY1JF221J∗	X	220	1/16W	Metal Oxide	AA
R1853	VRS-CY1JF221J∗	X	220	1/16W	Metal Oxide	AA
R1854	VRS-CY1JF103J∗	X	10k	1/16W	Metal Oxide	AA
R1855	VRD-RA2BE102J∗	X	1k	1/8W	Carbon	AA
R1861	VRS-CY1JF121J∗	X	120	1/16W	Metal Oxide	AA
R1862	VRS-CY1JF121J∗	X	120	1/16W	Metal Oxide	AA

BALUN

FB701	RBLN-0020CEZZ+	X	Balun, BLN-0020CE	AB

SWITCHES

S1001	QSW-K0202PEZZ+	X	Switch, CH-Up	AB
S1002	QSW-K0202PEZZ+	X	Switch, CH-Down	AB
S1003	QSW-K0202PEZZ+	X	Switch, VOL-Up	AB
S1004	QSW-K0202PEZZ+	X	Switch, VOL-Down	AB
S1005	QSW-K0202PEZZ+	X	Switch, MENU	AB
S1006	QSW-K0114CEZZ	X	Switch, POWER	AC

MISCELLANEOUS PARTS

⚠ F701	QFS-C3229CEZZ	X	Fuse, T3. 15A 250V	AB
⚠ FH701	QFSHD1013CEZZ+	X	Fuse Holder	AA
⚠ FH702	QFSHD1014CEZZ+	X	Fuse Holder	AA
J401	QJAKGA015WJZZ	X	Jack,	AE
J402	QJAKE0108CEZZ	X	Jack,	AB
J403	QJAKE0183CEZZ	X	Jack,	AB
J404	QJAKE0184CEZZ	X	Jack,	AB
J405	QJAKG0093CEZZ	X	Jack,	AE
J406	QJAKFA008WJZZ	X	Jack,	AC
P302	QPLGN0461CEZZA	X	Plug, 4Pin (S)	AB
P407	QPLGN0361CEZZA	X	Plug, 3Pin (WO)	AB
P601	QPLGN0660CEZZ	X	Plug, 6Pin (K)	AB
P602	QPLGN0461CEZZA	X	Plug, 4Pin	AB
P603	QPLGN0361CEZZA	X	Plug, 3Pin (TP651~3)	AB
P701	QPLGN0260CEZZ	X	Plug, 2Pin (M)	AB
P702	QPLGN0269GEZZ	X	Plug, 2Pin	AB
P705	QTiPM0083CEZZ	X	Tip (SG)	AB
P1001	QPLGN0561CEZZA	X	Plug, 5Pin	AB
P1002	QPLGN0561CEZZA	X	Plug, 5Pin (BC)	AB
P1007	QPLGN0461CEZZA	X	Plug, 4Pin	AB
P1008	QPLGN0461CEZZA	X	Plug, 4Pin	AB
P1011	QPLGN0361CEZZA	X	Plug, 3Pin	AB
P1012	QPLGN0361CEZZA	X	Plug, 3Pin	AB
RDA602	PRDAR0224PEFW	X	Heat Sink, Q602	AB
RDA501	PRDARA010WJFW	X	Heat Sink, IC501	AB
RDA701	PRDARA026WJFW	X	Heat Sink, Q701	AD
RDA301	PRDARA043WJFW	X	Heat Sink, IC301	AB
RMC1001	RRMCU0222CEZZ	X	Remote Receiver	AD
⚠ RY701	RRLYJ0093CEZZ	X	Relay	AE
	QCNW-A299WJZZ	X	Connecting Cord (K)	AB
	QCNW-A482WJZZ	X	Connecting Cord (DF)	AD
	QCNW-A529WJZZ	X	Connecting Cord (YUV)	AC
	QCNW-A530WJN1	X	Connecting Cord (AN)	AC
	QCNW-A531WJN1	X	Connecting Cord (FAV)	AC
	QCNW-A532WJN1	X	Connecting Cord (RAV)	AC
	QCNW-A534WJN1	X	Connecting Cord (MTS)	AC
	QCNW-A625WJZZ	X	Connecting Cord (P706)	AB

Ref. No.	Part No.	★	Description			Code
DUNTKA599WEA0 PWB-B CRT UNIT						
	TRANSISTORS					
Q853	VS2SC3789//2E	X	2SC3789			AB
Q854	VS2SC3789//2E	X	2SC3789			AB
Q855	VS2SC3789//2E	X	2SC3789			AB
Q894	VS2SA1015Y/1E+	X	2SA1015Y			AB
	DIODES					
D859	VHD1SS119//-1∗	X	1SS119			AA
D898	VHD1SS119//-1∗	X	1SS119			AA
	COIL					
L851	VP-MK820K0000+	X	Peaking, 82µH	10%		AB
	CAPACITORS					
C851	VCKYPA1HB221K+	X	220p	50V	Ceramic	AA
C852	VCKYPA1HB221K+	X	220p	50V	Ceramic	AA
C853	VCKYPA1HB221K+	X	220p	50V	Ceramic	AA
C880	RC-KZ0153CEZZ	X	0.001	3.15KV	Ceramic	AB
C893	VCEA0A1CW336M+	X	33	16V	Electrolytic	AA
	RESISTORS					
R849	VRD-RA2BE271J∗	X	270	1/8W	Carbon	AA
R850	VRD-RA2BE470J∗	X	47	1/8W	Carbon	AA
R851	VRD-RA2BE470J∗	X	47	1/8W	Carbon	AA
R852	VRD-RA2BE470J∗	X	47	1/8W	Carbon	AA
R854	VRD-RA2BE331J∗	X	330	1/8W	Carbon	AA
R855	VRD-RA2BE331J∗	X	330	1/8W	Carbon	AA
⚠ R859	VRS-VV3DB123J	X	12k	2W	Metal Oxide	AA
⚠ R861	VRS-VV3DB123J	X	12k	2W	Metal Oxide	AA
⚠ R863	VRS-VV3DB123J	X	12k	2W	Metal Oxide	AA
R864	VRD-RA2BE470J∗	X	47	1/8W	Carbon	AA
R876	VRD-RA2BE121J∗	X	120	1/8W	Carbon	AA
R877	VRD-RA2BE121J∗	X	120	1/8W	Carbon	AA
R878	VRD-RA2BE121J∗	X	120	1/8W	Carbon	AA
R880	VRD-RM2HD332J∗	X	3.3k	1/2W	Carbon	AA
R881	VRD-RM2HD332J∗	X	3.3k	1/2W	Carbon	AA
R882	VRD-RM2HD332J∗	X	3.3k	1/2W	Carbon	AA
R889	VRD-RA2BE821J∗	X	820	1/8W	Carbon	AA
R891	VRD-RA2BE561J∗	X	560	1/8W	Carbon	AA
R892	VRD-RA2BE391J∗	X	390	1/8W	Carbon	AA
R894	VRD-RA2BE152J∗	X	1.5k	1/8W	Carbon	AA
R895	VRD-RA2BE561J∗	X	560	1/8W	Carbon	AA
	MISCELLANEOUS PARTS					
P860	QPLGN0461CEZZ	X	Plug, 4Pin			AA
P880	QPLGN0561CEZZ	X	Plug, 5Pin			AB
SC851	QSOCV0933CEZZ	X	Socket,			AC
DUNTKB271WEA1 PWB-E MTS MODULE UNIT						
	INTEGRATED CIRCUITS					
IC3001	VHiCXA2074Q-1S	X	CXA2074Q			AP
IC3002	VHiMM1501XN-1∗	X	MM1501XN			AC
	TRANSISTORS					
Q3001	VS2SD601AR/-1∗	X	2SD601AR			AA
Q3002	VS2SD601AR/-1∗	X	2SD601AR			AA
Q3004	VS2SD601AR/-1∗	X	2SD601AR			AA
Q3005	VS2SD601AR/-1∗	X	2SD601AR			AA
Q3006	VS2SD601AR/-1∗	X	2SD601AR			AA
Q3007	VS2SD601AR/-1∗	X	2SD601AR			AA
	CAPACITORS					
C3001	VCE9GA1HW475M+	X	4.7	50V	Electrolytic	AB
C3002	VCKYCY1HB562K∗	X	5600p	50V	Ceramic	AA
C3003	VCQYTA1HM123K+	X	0.012	50V	Mylar	AA
C3004	VCEA0A1HW105M+	X	1	50V	Electrolytic	AA
C3005	VCEA0A1HW475M+	X	4.7	50V	Electrolytic	AA
C3006	VCEA0A1CW106M+	X	10	16V	Electrolytic	AA
C3007	VCEA0A1HW475M+	X	4.7	50V	Electrolytic	AA
C3008	VCKYCY1HF103Z∗	X	0.01	50V	Ceramic	AA
C3009	VCEA0A1CW227M+	X	220	16V	Electrolytic	AB
C3010	VCE9GA1HW475M+	X	4.7	50V	Electrolytic	AB
C3011	VCEA0A1HW475M+	X	4.7	50V	Electrolytic	AA
C3012	VCE9GA1HW475M+	X	4.7	50V	Electrolytic	AB
C3013	VCKYCY1HB272K∗	X	2700p	50V	Ceramic	AA
C3014	VCQYTA1HM473K+	X	0.047	50V	Mylar	AA
C3015	VCEACA1HC335K+	X	3.3	50V	Electrolytic	AB
C3016	VCE9GA1HW475M+	X	4.7	50V	Electrolytic	AB
C3017	VCEACA1CC106K+	X	10	16V	Electrolytic	AB
C3018	VCEA0A1HW105M+	X	1	50V	Electrolytic	AA
C3019	VCEA0A1CW106M+	X	10	16V	Electrolytic	AA
C3020	VCEA0A1CW106M+	X	10	16V	Electrolytic	AA
C3021	VCEA0A1CW106M+	X	10	16V	Electrolytic	AA
C3022	VCEA0A1CW106M+	X	10	16V	Electrolytic	AA
C3023	VCKYCY1HF103Z∗	X	0.01	50V	Ceramic	AA
C3024	VCKYCY1HF103Z∗	X	0.01	50V	Ceramic	AA
C3025	VCKYCY1HF473Z∗	X	0.047	50V	Ceramic	AA
C3026	VCKYCY1HF473Z∗	X	0.047	50V	Ceramic	AA
C3030	VCQYTA1HM682K+	X	6800p	50V	Mylar	AA
C3031	VCKYCY1HF682Z∗	X	6800p	50V	Ceramic	AA
C3034	VCEA0A1HW224M+	X	0.22	50V	Electrolytic	AA
C3037	VCEA0A1HW335M+	X	3.3	50V	Electrolytic	AA
C3038	VCEA0A1HW335M+	X	3.3	50V	Electrolytic	AA
C3039	VCEA0A1HW224M+	X	0.22	50V	Electrolytic	AA
C3042	VCKYCY1HB681K∗	X	680p	50V	Ceramic	AA
C3043	VCKYCY1HB681K∗	X	680p	50V	Ceramic	AA
C3044	VCEA0A1EW476M+	X	47	25V	Electrolytic	AA
C3045	VCEA0A1HW335M+	X	3.3	50V	Electrolytic	AA
C3046	VCEA0A1HW335M+	X	3.3	50V	Electrolytic	AA
C3047	VCEA0A1HW335M+	X	3.3	50V	Electrolytic	AA
C3048	VCEA0A1HW335M+	X	3.3	50V	Electrolytic	AA
C3080	VCEA0A1CW106M+	X	10	16V	Electrolytic	AA
C3081	VCEA0A1CW106M+	X	10	16V	Electrolytic	AA
C3082	VCKYCY1HF103Z∗	X	0.01	50V	Ceramic	AA
C3083	VCEAKA1CW106M+	X	10	16V	Electrolytic	AB
	RESISTORS					
R3001	VRS-CY1JF221J∗	X	220	1/16W	Metal Oxide	AA
R3002	VRS-CY1JF221J∗	X	220	1/16W	Metal Oxide	AA
R3003	VRS-CY1JF105J∗	X	1M	1/16W	Metal Oxide	AA
R3004	VRS-CY1JF104J∗	X	100k	1/16W	Metal Oxide	AA
R3005	VRS-CY1JF623J∗	X	62k	1/16W	Metal Oxide	AA
R3007	VRS-CY1JF332J∗	X	3.3k	1/16W	Metal Oxide	AA
R3008	VRS-CY1JF302J∗	X	3k	1/16W	Metal Oxide	AA
R3010	VRS-CY1JF392J∗	X	3.9k	1/16W	Metal Oxide	AA
R3011	VRS-CY1JF102J∗	X	1k	1/16W	Metal Oxide	AA
R3012	VRS-CY1JF102J∗	X	1k	1/16W	Metal Oxide	AA
R3013	VRS-CY1JF102J∗	X	1k	1/16W	Metal Oxide	AA
R3014	VRS-CY1JF102J∗	X	1k	1/16W	Metal Oxide	AA
R3016	VRS-CY1JF102J∗	X	1k	1/16W	Metal Oxide	AA
R3018	VRS-CY1JF102J∗	X	1k	1/16W	Metal Oxide	AA
R3019	VRS-CY1JF102J∗	X	1k	1/16W	Metal Oxide	AA
R3021	VRS-CY1JF102J∗	X	1k	1/16W	Metal Oxide	AA
R3024	VRS-CY1JF000J∗	X	0	1/16W	Metal Oxide	AA
R3025	VRS-CY1JF272J∗	X	2.7k	1/16W	Metal Oxide	AA
R3026	VRS-CY1JF331J∗	X	330	1/16W	Metal Oxide	AA
R3027	VRS-CY1JF392J∗	X	3.9k	1/16W	Metal Oxide	AA
R3028	VRS-CY1JF683J∗	X	68k	1/16W	Metal Oxide	AA
R3029	VRS-CY1JF392J∗	X	3.9k	1/16W	Metal Oxide	AA
R3030	VRS-CY1JF683J∗	X	68k	1/16W	Metal Oxide	AA
R3031	VRS-CY1JF182J∗	X	1.8k	1/16W	Metal Oxide	AA
R3032	VRS-CY1JF223J∗	X	22k	1/16W	Metal Oxide	AA
R3033	VRS-CY1JF102J∗	X	1k	1/16W	Metal Oxide	AA
R3034	VRS-CY1JF182J∗	X	1.8k	1/16W	Metal Oxide	AA
R3035	VRS-CY1JF223J∗	X	22k	1/16W	Metal Oxide	AA
R3036	VRS-CY1JF102J∗	X	1k	1/16W	Metal Oxide	AA
R3080	VRS-CY1JF101J∗	X	100	1/16W	Metal Oxide	AA
R3081	VRS-CY1JF101J∗	X	100	1/16W	Metal Oxide	AA
R3082	VRS-CY1JF103J∗	X	10k	1/16W	Metal Oxide	AA
R3083	VRS-CY1JF103J∗	X	10k	1/16W	Metal Oxide	AA
R3084	VRS-CY1JF103J∗	X	10k	1/16W	Metal Oxide	AA
R3085	VRS-CY1JF103J∗	X	10k	1/16W	Metal Oxide	AA

Ref. No.	Part No.	★	Description	Code
			MISCELLANEOUS PARTS	
P3001	QPLGZ0810CEZZ	X	Plug, 8Pin (M)	AB
P3002	QPLGN0441CEZZ	X	Plug, 4Pin (RAV)	AA
P3003	QPLGN0441CEZZ	X	Plug, 4Pin (FAV)	AA
P3004	QPLGN0361CEZZ	X	Plug, 3Pin (WF)	AA
P3008	QPLGZ0810CEZZ	X	Plug, 8Pin (N)	AB
P3009	QPLGZ0610CEZZ	X	Plug, 6Pin (SW)	AB
P3012	QPLGN0241CEZZ	X	Plug, 2Pin (AV)	AA
P3013	QPLGN0241CEZZ	X	Plug, 2Pin (AN)	AA

MISCELLANEOUS PARTS

Ref. No.	Part No.	★	Description	Code
⚠ ACC701	QACCZ3008PEZZ	X	AC Cord	AE
SP301	VSP1205PB09WA	X	Speaker	AK
	LHLDK0014PEZZ	X	AC Cord Holder	AB
	LHLDW1047PEZZ	X	Wire Holder	AB
	LHLDZ0063PEZZ	X	Anode Clamp Holder	AB
	LHLDZA096WJZZ	X	Holder	AB
	LHLDZA107WJZZ	X	Holder	AB
	TCAUS3000GJZZ	X	Caution Label	AA
	XTASD30P12000	X	Screw, x3	AA
	XTASD40P16000	X	Screw, x8	AA
	XTASD40P20000	X	Screw, x4	AA
	QCNW-A871WJZZ	X	Connecting Cord	AB
	QCNW-A872WJZZ	X	Connecting Cord	AC
	QCNW-A873WJZZ	X	Connecting Cord	AC
	QPLGA0017CEZZ	X	Plug	AC

SUPPLIED ACCESSORIES

Ref. No.	Part No.	★	Description	Code
			ACCESSORIES	
	RRMCGA108WJSA	X	Infrared R-C	AT
	TiNS-A372WJZZ	X	Operation Manual	AE

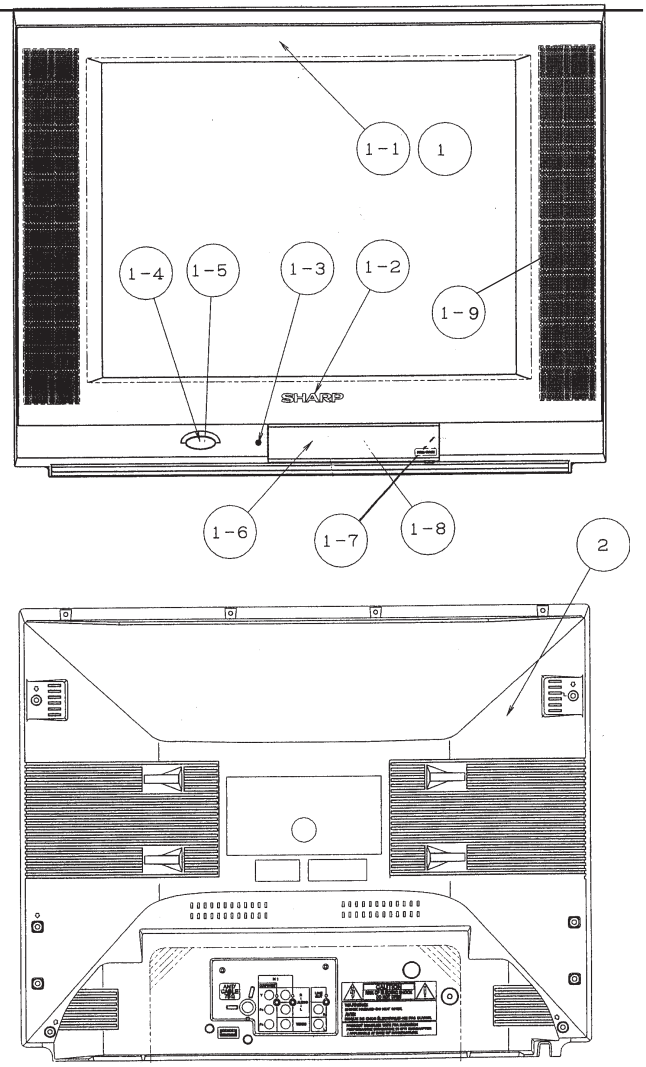
PACKING PARTS
(NOT REPLACEMENT ITEM)

Ref. No.	Part No.	★	Description	Code
	SPAKCA318WJZZ	-	Packing Case	AS
	SPAKPA055WJZZ	-	Wrapping Paper	AE
	SPAKXA145WJZZ	-	Buffer Material	AK
	SSAKA0101GJZZ	-	Polyethylene Bag	AB
	TLABM0005GJZZ	-	Model Label	AB
	TLABZA153WJZZ	-	POP Label	AK

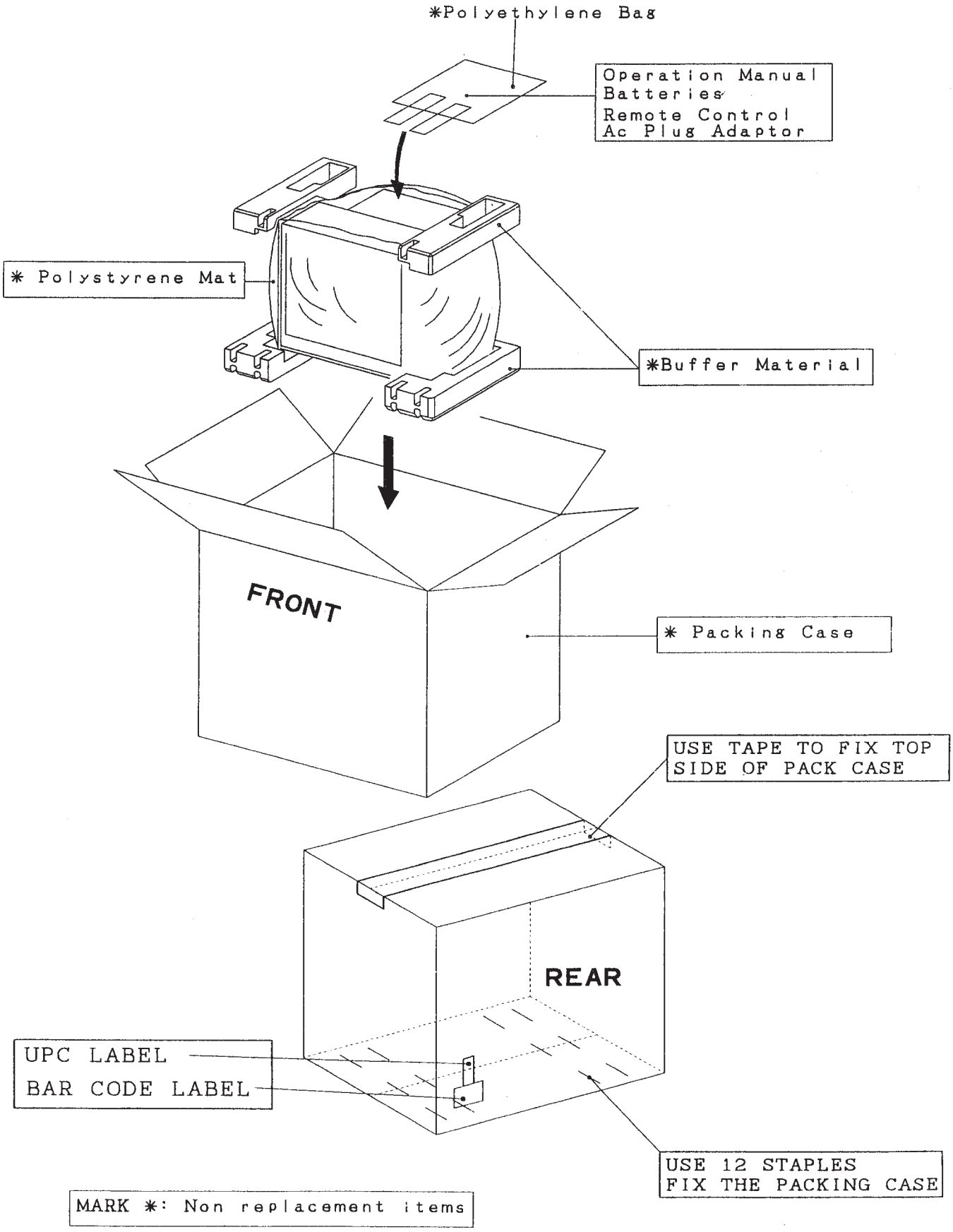
CABINET PARTS

Ref. No.	Part No.	★	Description	Code
1	CCABAA146WEH0	X	Front Cabinet Ass'y	BC
1-1	Not Avairable	-	Front Cabinet	—
1-2	HBDGB3155CESA	X	SHARP Badge	AC
1-3	HDECQ119WJSA		R/C Cover	AC
1-4	JBTN-A070WJSA	X	Button, Power	AC
1-5	MSPRC0005PEFW	X	Spring, for Power Button	AA
1-6	GDORFA015WJSA	X	Door	AE
1-7	MSPRPA012WJFW		Door Spring	AB
1-8	HiNDPA194WJSA	X	Indication Plate	AB
1-9	GBFL-A007WJZZ	X	Baffle, x2	AC
2	GCABBA088WJKA	X	Rear Cabinet	AX

CABINET PARTS LOCATION



PACKING OF THE SET



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